THE IRON TRADE REVIEW

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SLOW PROGRESS

AND BETTER FEELING CHARACTERIZE THE MARKET.

Some Increase in Railroad Orders—Buying of Pig Iron Confined Largely to Eastern Territory.

Slow improvement continues to characterize the iron market. The United States Steel Corporation is now running about 56½ per cent of its blast furnace capacity, and about 58 per cent of its finishing capacity. Its stocks of iron are lower than in June, 1907, when the previous low figure in the recent history of the Corporation was established. Any sudden increase in new business will mean the blowing in of several additional stacks.

Pig Iron Conditions

Buying of pig iron has shifted to the East, and about 40,000 tons have been purchased in that section, a considerable part going to New England. Southern prices have advanced on account of heavy buying reported last week, and very little iron can now be purchased at $12 Birmingham for No. 2. In the central west, sales are not numerous, but inquiries have been coming in in very fair volume. Unsold stocks in southern yards are estimated at 70,000 tons.

Structural Material

Improvement can be noted in the demand for structural material. Some orders of good size have been placed in New York, and numerous projects promise to develop into orders at a not far distant date. The erection of the Equitable building, which will require 40,000 tons of steel, seems much more probable. The American Bridge Co. has taken an order for 2,000 tons for a mercantile building at Portland, Ore.; the Fort Pitt Bridge Works will furnish from 3,000 to 4,000 tons of bridge work for the Western Pacific railway, and an order for 1,200 tons for the Northwestern Elevated terminal, at Chicago, has been placed. The Bitter Root Valley Erection Co. has purchased 1,000 tons of plates.

Railroad Buying

Since the announcement of the contract for 28,000 tons of standard Bessemer rails placed with the United States Steel Corporation by the Harriman Mexican line no important new business in heavy rails has been reported, but western railroads have been specifying freely on contracts, and sales of light rails have amounted to a considerable tonnage. The American Locomotive Co. has received an order for 30 locomotives for an Argentine railway. The Harriman inquiry for 7,000 cars closes Aug. 17. The Pennsylvania Steel Co. has taken orders for the structural steel for nine bridges for the Alabama & Great Southern railway, one for the Norfolk & Western, and one for the Wheeling & Lake Erie.

Steel Bars and Sheets

Specifications on steel bars have increased, especially in the western territory, and this branch of the steel business is in very good condition. Bar iron is dull and mills are running irregularly. There is more activity in sheets, but cutting by independent interests still continues. Production of tin plate has been slightly increased, the percentage of activity of the leading interest now being 54.

Coke and Old Material

The old material market shows rather surprising strength, but the activity is confined largely to dealers. The coke market is dull in nearly all sections, and prices show little change.

STEADY INCREASE

IN EXPORTS OF FINISHED IRON AND STEEL PRODUCTS.

Although Tonnage Declines, Value for the Year Breaks All Records—Decline of More Than One-Half in Imports.

While June iron and steel exports showed a slight gain over May, the total is otherwise the smallest for any month since July, 1905. Imports showed a considerable increase, the chief item being pig iron. Probably the gain was really in the manganese metals, which are not shown separately in the monthly returns.

The total exports in the fiscal year ended with June were 1,161,270 gross tons, showing a decline of 5.5 per cent from the fiscal year 1907 and of 12.8 per cent from the fiscal year 1906. In the fiscal year 1907 the production of pig iron was 26,202,985 tons, and in the fiscal year just ended, 19,221,321 tons, showing a decline of 26.6 per cent, so that the decline in domestic demand has been much greater than in the export market.

Our exports by months in the past two fiscal years have fluctuated as follows:

	Fiscal Years.	
	1907.	1908.
July	98,837	121,400
August	117,526	118,944
September	89,352	115,869
October	104,595	123,216
November	99,425	116,308
December	99,876	85,999
January	102,630	74,352
February	87,912	81,755
March	112,787	96,437
April	132,792	93,522
May	91,543	64,020
June	92,996	69,779
Totals	1,229,245	1,161,270

Exports in the past seven fiscal years compare as follows:

1902	495,661
1903	302,492
1904	676,590
1905	1,123,580
1906	1,331,323
1907	1,229,245
1908	1,161,270

Change in Kind of Exports.

Our iron and steel exports did not assume much importance until about the calendar year 1904. There had

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THE WEEK IN IRON CENTERS

PITTSBURG.

Business Improves Slowly — Marked Improvement in Sentiment.

Office of THE IRON TRADE REVIEW,
510 Park Bldg., Aug. 11.

Progress is being made by the iron and steel industry, but it is of the slow and sure order. There is nothing decisive in the movement of the industry at the present time, no widespread resumption of mills which have been idle for months, or any marked and consistent increase in orders all along the line of iron and steel products.

The improvement does not appear to have yet reached such a stage. It is now manifesting itself in a small but regular gain in orders and specifications which, though gratifying in itself, will mean the lapse of a number of months before full recovery is reached, even if the gait is maintained. Manufacturers are finding their main source for encouragement in the regularity of the advance of the market, week in and week out, for though the changes are not large, they are usually to be found upon the right side of the ledger when the balance has been struck. July was a good month for most companies, while August is holding its own and making some gains.

The rather significant change that has come over the situation in the past six weeks has been the improvement in sentiment. Where doubt and uncertainty were apparent a short time ago, more cheerful feelings regarding the future may now be generally found. Some lines of trade, notably those dependent upon the patronage of the railroads, are still in the rut, but the tone has undoubtedly improved.

As to products, steel bars, regarded as the barometer of the trade, continue to move in a satisfactory volume, but bar iron is dull; sheets are gaining as the tin plate declines and merchant pipe is maintaining its gain. Structural looks better, plates are rather quiet and the off-seasonable lines, such as hoops, cotton ties and wire products, are not active.

The Carnegie Steel Co. this week put an additional furnace in blast at its Edgar Thomson works, making 30 out of a total of 55 furnaces, now in operation. The finishing mills are running at about 55 per cent of capacity.

Pig Iron.—Sales of pig iron this week have not been many or of large tonnage. The inquiry is holding up well, however, and it is expected that considerable business will result. At the same time, there are indications to the effect that a tidy tonnage of iron, particularly foundry iron, is being quietly transferred from furnaces to consumers.

The low prices on Bessemer and foundry iron are bringing some consumers into the market for extended requirements. The largest of these now in the market is that of a local foundry and engineering company for from 3,000 to 4,000 tons of Bessemer and 3,000 to 4,000 tons of malleable, prices being asked for either prompt delivery or shipments up to June, 1909. Another Pittsburg company has an inquiry out for 3,000 tons of gray forge and 1,000 tons of Bessemer, and is understood to have placed a portion of the tonnage. There is nothing of evidence in the market that Bessemer, except in special cases, is selling below $15.50 valley, or foundry below $14.50 for No. 2. Basic is very quiet and its strength cannot be determined. Furnace operations and Bessemer and basic stocks in the valleys show no change this week.

The southern situation continues to display strength. Stocks have reached such a low point and the miners' strike has so clouded the future that some companies have withdrawn entirely from third quarter business and are waiting for the atmosphere to clear. Sales for the third quarter, however, are reported at $12.50 Birmingham for No. 2, which is now the figure generally held by the larger companies. On third quarter shipment on northern iron, we quote as follows:

Bessemer, valley	$15.50 to 15.75
Bessemer, Pittsburg	16.40 to 16.65
No. 1 foundry, Pittsburg	15.90 to 16.15
No. 2 foundry, Pittsburg	15.40 to 15.65
Gray forge, Pittsburg	14.90 to 15.15
Basic, valley	15.00 to 15.50
Basic, Pittsburg	15.90 to 16.40

Ferro Alloys.—There is not a great deal of activity in ferro-manganese at the present time, but the prices of $44 to $45 Baltimore or $45.95 to $46.95 Pittsburg are unchanged. For prompt shipment these prices can be shaded. Ferro-silicon, fifty per cent, is irregular in price.

Imported 50 per cent ferro-silicon is quoted $70 Pittsburg on forward deliveries; domestic 12 per cent, $29; 11 per cent, $28; 10 per cent, $27. The lower grades of imported ferro-silicon are upon about the same basis. These quotations are applicable to Pittsburg territory.

Plates.—A fair tonnage, generally in small sized orders, is coming to the mills. Plate material for oil and gas pipe lines is quite active. The Carnegie Steel Co. is rolling 2,000 tons of plates for a riveted pipe-line at Seattle, Wash., the general contract for which is held by the James McNeil & Bro. Co., Pittsburg. Price cutting by some mills continues. We quote:

Tank plates, ¼-inch thick, 6¼ to 100 inches, 1.60c f. o. b. mill Pittsburg. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½-inch to and including 3/16-inch plate on thin edges, 0.10c; under 3/16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—The sheet market continues to slowly grow more active. The contract side of the market is better and specifications against old contracts have quite materially increased. The American Sheet & Tin Plate Co. this week is operating 57 per cent of its capacity against 55 per cent last week. Shading of sheet prices is largely confined to carloads or quick shipment material. We quote:

Black steel sheets, cold rolled, No. 28 gage, $2.50 per 100 pounds, and galvanized sheets, No. 28 gage, $3.55 per 100 pounds, plus the regular extras.

Blue annealed: Nos. 11-12, 1.85c; Nos. 13-14, 1.90c; Nos. 15-16, 2c. Corrugated roofing, $1.75 per square for No. 28 painted, 2½-inch corrugation; and $3.10 per square on galvanized roofing, 2½-inch corrugation, No. 28.

Tin Plate.—A slight increase in tin plate production this week over last week is shown, additional hot mills having been started. The percentage of activity of the leading interest this

week is 54 corresponding to 51 last week. The canners and packers having completed their main buying movement, are holding in reserve considerable business which will be placed in September and this in addition to the roofing tin and other trades, will add much tonnage to mill books. We quote:

Coke tin plate, 100-pound basis, 14 x 20, $3.70 f. o. b. mill Pittsburg district. Terms, 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—No additional sales of standard sections are reported, but specifications are heavier. Light rails remain active. Owing to the advance in scrap rails, the rerolling mills continue to advance their prices and the Maryland Rail Co., Linton Rolling Mill Co. and the West Virginia Rail Co. recently increased their quotations from $24 to $26 f. o. b. mill. Spikes are dull. On present specifications on Bessemer rails, we quote as follows:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $36; 12-pound, $32; 16-pound, $30; 20-pound, $29; 25 to 45-pound, $28; angle splice bars for standard sections, $1.65; standard spikes, $1.70 to $1.80 Pittsburg; hand spikes, $1.80 to $1.90 Pittsburg.

Steel.—The steel market is quiet as far as new business goes, but a moderate tonnage is being drawn on contracts. Sheet and tin bars are moving less briskly owing to the decline in tin plate operations.

Bessemer and open-hearth billets, base sizes, are quoted at $25 Pittsburg, and forging billets at $27 Pittsburg, subject to the division of the freight charge over $1 and not exceeding $3, and sheet and tin bars at $27.50 Pittsburg, valley and Wheeling territory, and $27 Pittsburg for delivery to other points.

Hoops, Bands and Cotton Ties.—The activity in the hoop and tie market is largely on specifications against contracts, but prospects for fall business are reported good. We quote:

Cotton ties, 85c per bundle Pittsburg, plus the freight on lots of 3,000 bundles or more, and 88c per bundle Pittsburg for less than 3,000 bundle lots.

Hoops in carloads lots, 1.80c; in less than carload lots, 1.90c; bands, 1.40c, base half extras as per standard steel.

Merchant Bars.—Specifications against steel bar contracts to this date in August have increased over July and makers express satisfaction at the trend of conditions. It is estimated that bar mills are now operating at about 55 per cent of capacity. There is a better tone in bar iron, with some evidence of stiffening in the east in that several of the mills in that section are now holding at $1.40 mill. Dissatisfaction at present prices is growing among bar iron manufacturers. The steel plant of the Republic Iron & Steel Co. is idle this week and operations in general are less full. Shafting is quiet. Nuts and bolts are showing some improvement. We quote:

Common iron bars, 1.40c Pittsburg in carload lots and over; 1.45c in less than carloads; 1.32c to 1.35c base Pittsburg plus freight to point of shipment on western deliveries; Bessemer steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under 3 inches, 1.50c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting 56 per cent in carloads, and 52 per cent less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. Planished and machine straightened tire steel is 1.80c base. Iron finished tire under 1½ by 1½ inches, 1.75c; iron finished tire, 1½ by 1½ and over, 1.60c. All tire subject to ½ extra on the steel card.

On cold rolled strip steel, width 1½ inches and wider, and 0.100 inch and thicker, we quote base prices per 100 pounds, $3.35 on hard, and $3.60 on soft.

Structural Material.—The structural market is better and displays more life. The inquiry has increased and a greater effort is apparently being made to advance work now in estimators' hands. Fabricating prices continue low. The railroads are showing no more activity in bridge work. Structural mills are running on fair schedules. In this territory the Joseph Horne Co. addition, 3,000 tons, and the joint bridge by Allegheny and Washington counties, 3,000 tons, which had already been mentioned, are the principal jobs for which the contracts have not yet been awarded. We quote:

Beams and channels, 15-inch and under, 1.60c; over 15 inches, 1.70c; zees, $1.60c; tees, 1.65c; angles from 3 to 6 inches, 1.60c; universal and sheared plates, 6¼ inches and wider, 1.60c base.

Merchant Pipe.—A greater consumption of merchant pipe has brought increased specifications from jobbers, this condition being contributed to in some sections of the country by the prevalence of a dry spell and a consequent demand for water pipe. Jobbers are not, however, taking tonnage for stock. Line pipe goods are in steady demand and several fair-sized projects are now in the market. A local gas company this week closed for eight miles of 10-inch iron pipe. Prices are firm. We quote the following official base discount, with an additional one point and five off to jobbers:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
¾ to 6 inches....	75	65	73	63

Boiler Tubes.—Better specifications for boiler tubes are being received by the mills and there is more business in the market. The railroads continue to limit their buying to real needs. We quote the following official base discount to the general trade:

BOILER TUBES.

	Iron.	Steel.
2¾ to 5 inch.....	52	65

Wire Products.—The wire business is moving quietly through the present season of the year, but the market has been cleared of much of the retarding influences and the prospects for fall trade are bright. The present volume of business moving is not heavy. There is considerable activity in cut nails, jobbers buying more freely. The Pittsburg Steel Co. last week started in operation four of its eight new open-hearth furnaces in its enlarged plant at Monessen. We quote:

Wire nails, jobbers' carload lots, $1.95; retailers' carload lots, $2.00; painted barb wire, jobbers' carload lots, $2.10; retailers' carload lots, $2.15, with 30c for galvanizing; plain wire to jobbers in carloads, 1.80c; and to retailers in carloads, 1.85c.

Wire Rods.—New business in wire rods is not heavy. Specifications are fair and we quote $33 Pittsburg on Bessemer, and $34 Pittsburg on open-hearth rods.

Coke.—The coke market is a shade more active, but prices have not changed. A number of cars on track still command the prompt market and low prices for immediate shipment are not infrequent. The H. C. Frick Coke Co. has materially increased its operations, but there is little change among the independents. We quote standard Connellsville foundry coke at from $2 to $2.25 ovens, and standard Connellsville furnace coke at from $1.65 to $1.85 ovens. For the week ending Aug. 1 the *Courier* shows 18,156 active ovens, 19,361 inactive, and output of 189,423 tons, compared

with 18,010 active ovens, 19,462 inactive, and output of 188,799 tons.

Old Material.—The dealers continue to furnish the activity in old material, apparently being imbued with the belief that a sharp increase in mill operations will come in September or a little later. The mills at present, however, are doing comparatively nothing with the scrap market. The Pennsylvania railroad has disposed of some of its accumulated old rails, and its list this month offers a decreased amount, about 20,000 tons. The Baltimore & Ohio sold about 3,000 tons. We quote gross tons, delivered in the Pittsburg territory as follows:

Heavy melting scrap, $14.50 to $15; re-rolling rails, $15.50 to $16; bundled sheet scrap, $11.50 to $12; iron axles, $20.50 to $21; old iron rails, $16 to $17; No. 1 wrought scrap, $14 to $14.50; old car wheels, $14 to $14.50; low phosphorus, $18 to $18.50; machine shop turnings, $9 to $9.50; cast borings, $8.50 to $9; No. 1 cast scrap, $14 to $14.50; malleable, $14.

CHICAGO.

Large Order for Small Forging Billets—Improvement in Some Finished Lines.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Aug. 11.

The most striking transaction in the local market during the week was the purchase of 6,000 tons of small forging billets by the Phoenix Horseshoe Co., from the leading interest. This inquiry first entered the market a number of weeks ago and it is significant that the order, intended to bring out low prices, was finally closed at the schedule. Steel bar specifications show very satisfactory volume and substantial increases as the manufacturing season progresses. The demand for plates during the week was much better than has been the rule and one order for 1,000 tons of plate for a pipe line in the west is noted. Trade in sheets displays no changes of interest. A much better week for structural steel contracts is recorded and in the western territory contracts aggregating, approximately, 4,000 tons were closed. The railroad situation can hardly be said to have improved, but at the same time some of the western roads have come forward with splendid specifications on rail contracts and specifications for track fastenings are very fair. It is also worthy of note that the local maker of car wheels has started up its Stockyards plant and has increased the active melting capacity at its other operating plant. Light rail sales have enjoyed almost an unusual volume during the last three weeks and a number of tie plate orders have been placed. Wire products are moving briskly. The freight situation is largely indeterminate. A small increase on southwestern lines took effect on Aug. 10 and a change of classification which will raise the minimum from 30,000 pounds to 36,000 pounds for carload shipments, applying to steel products, goes into effect between Oct. 1 and 15, but it is understood that within a very few days it has been announced that a general increase is deemed unwise by the railroads at this time.

Pig Iron.—The strengthening of the market for southern irons caused by the large purchases mentioned last week has affected practically all of the southern interests and the instances where less than $12.50 Birmingham is considered are distinctly the exception. It is possible, however, that some southern iron might be bought at the $12 price. From the standpoint of the furnace capacity now in blast, the southern output is undoubtedly well sold up for the year, but latest reports indicate that less than 50 per cent of the stacks are in blast. This percentage does not hold, however, with two or three of the leading interests which have almost their entire capacity in blast. In the north, the price situation remains unchanged with most of the sales being made at $17, local furnace. In general, the volume of ordinary sales is increasing, unfortunately at a rate that is apparently more rapid than the improvement in the melt of pig iron. At the same time, it is noteworthy that the number of requests for delayed delivery is unusually small. The explanation of this situation is not altogether clear. We quote as follows:

Lake Superior Charcoal	**$19.50 to 20.00**
Southern Foundry No. 1	16.85 to 17.35
Southern Foundry No. 2	16.35 to 16.85
Southern Foundry No. 3	15.85 to 16.35
Southern Foundry No. 4	15.35 to 15.85
Southern No. 1 Soft	16.85 to 17.35
Southern No. 2 Soft	16.35 to 16.85
Southern No. 2 Soft	**15.85 to 16.35**
Southern Gray Forge	15.10 to 15.60
Southern Mottled	14.85 to 15.10
Southern Silveries, 4 per cent Silicon	18.85 to 19.35
Southern Silveries, 5 per cent Silicon	18.85 to 19.35
Southern Silveries, 6 per cent Silicon	19.85 to 20.35
Jackson Co. Silveries, 6 per cent	**19.90 to 20.40**
Jackson Co. Silveries, 8 per cent	**20.90 to 21.40**
Jackson Co. Silveries, 10 per cent	21.90 to 22.40
Malleable Bessemer	17.25 to 17.75
Standard Bessemer	**18.25 to 18.75**
Alabama Basic	**16.35 to 16.85**

Billets and Rods.—The inquiry for 16,000 tons of billets put out by the Phoenix Horseshoe Co. resulted in the placing last week of a contract for 6,000 tons of 1½ to 3-inch forging billets with the Illinois Steel Co. The contract was taken, it is reported, at the full price for forging billets, less than 4 x 4 inches, namely, $27.50 Chicago. Orders for forging billets and specifications covering small quantities are increasing in number and this is taken as an indication of actually increased operations on the part of the smaller forge shops. A report to the effect that a change has been made in the price of wire rods is denied officially. We quote rolling billets $26.50, and forging billets $28.50, base, Chicago. We quote, f. o. b. Pittsburg, Bessemer wire rods, $33; open-hearth, $34; chain rods, $33.

Merchant Bars.—A survey of the July business in steel bars shows that specifications increased some 64 per cent over June. The first week in August shows an even more favorable comparison with the same week in July. A less satisfactory feature of the present specifying by the implement interests is a disposition to specify in small quantities, assuming the ability of the mills to ship promptly for an indefinite time to come. In view of the low stocks in the hands of many manufacturers, this may result in a decided crowding of the mills later. Mill activity is about as a week ago. Reports from the jobbing trade are to the effect that increases in the movement of material are not pronounced, but that in general better conditions prevail. We quote for Chicago delivery as follows:

Bar iron, 1.50c to 1.53c; soft steel bars and bands, 1.58c, half extras; soft steel angles, less than 3 x 3, 1.68c; hoops, 1.98c base, full extras; planished or smooth finished tire steel, 1.78c; iron finish, up to 1½ x ½-inch, 1.73c base tire card; iron finish, 1½ x ½-inch and larger, 1.58c base steel card; channel for solid rubber tire, ¾ to 1-inch, 2.08c, and 1⅛-inch and larger, 1.98c; smooth finished machinery steel, 1.83c; flat sleigh shoe, 1.63c; concave and convex sleigh shoe, 1.83c; cutter shoe, 2.05c; toe calk steel, 2.13c; railway spring, 1.93c base steel card; vehicle spring steel, 1.98c base, vehicle card; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are 56 per cent off the list for carload lots, and 52 per cent off for less than carload lots, carload freight allowed to points in base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 1.90c to 2c, full extras; soft steel bars, 1.80c per 100 pounds base, plus half extras; soft steel hoops, 2.30c, full extras.

Plates.—Improvement in the volume of plate orders is noted in this market and the plate mill of the principal producer, started a week ago with orders sufficient for three days' run-

ning, now has more orders on hand after operating continuously than when the run was started. Allis-Chalmers placed an order for nearly 400 tons of 3/16-inch plate during the week and a number of boilermakers have sent in for their immediate requirements. We quote as follows:

Plates, ¼-inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.78c Chicago. For extras see Pittsburg report. Jobbers' prices for shipment from local stocks are as follows: Tank steel, ¼-inch and heavier, up to 72 inches wide, 2c to 2.10c; from 72 to 96 inches wide, 2.10c to 2.20c; 3/16-inch up to and including 60 inches wide, 2.10c to 2.15c; 72 inches wide, 2.35c to 2.45c; No. 8, up to 60 inches wide, 2.10c to 2.15c; flange and head quality, 25c extra.

Sheets.—No market changes are apparent in the sheet trade and important transactions are few and far between. The routine assortment of small orders continues sufficiently active to maintain in operation the mills of this territory at about the same rate as for several weeks past. Prices are fairly regular and we quote from store as follows (for mill prices see Pittsburg report):

No. 10, 2.15c to 2.25c; No. 12, 2.20c to 2.30c; No. 14, 2.25c to 2.35c; No. 16, 2.35c to 2.45c; Nos. 18-20, 2.60c to 2.65c; Nos. 22-24, 2.65c to 2.70c; No. 26, 2.70c to 2.75c; No. 27, 2.75c to 2.80c; No. 28, 2.85c to 2.95c; No. 30, 3.25c. Galvanized sheets, No. 10 to 16, 3.05c to 3.10c; Nos. 18 to 20, 3.15c to 3.25c; Nos. 22 to 24, 3.30c to 3.35c; No. 26, 3.50c to 3.55c; No. 27, 3.70c to 3.75c; No. 28, 3.90c to 4.00c; No. 30, 4.40c to 4.50c.

Structural Steel.—Locally the principal contract for structural steel was the letting of the work for the new Northwestern Elevated R. R. stub terminal calling for about 1,200 tons. The contract was awarded to the Brennan Construction Co., general contractor, and the steel will be furnished by the Morava Steel Construction Co., Chicago. In the tonnage taken by the leading fabricator, the largest order was for 1,000 tons of steel pipe plates for the Bitter Root Valley Irrigation Co. in Montana. This, with a number of small orders, made up a total of about 1,700 tons. The Kansas City Structural Steel Co. took the contracts to furnish 500 tons of steel for the Geo. A. Fuller Construction Co., which is building the Meyer-Simons building in Kansas City, and also 350 tons for a tank building for the Armour Packing Co. At Salt Lake City, a total of 138 tons of structurals for the Auerbach theater and the Great Western Sugar Co. was taken by Silver Bros. of that place. The contract for the Meier-Frank building at Portland, Ore., is being let this week. The steel will amount to 1,500 tons. The International Harvester Co., through its subsidiary, the Wisconsin Steel Co., will erect a new mill building at a cost of about $35,000 and requiring about 350 tons of steel. The contract will probably be let within a week.

Prices still evidence willingness in some quarters to take work at cost figures, but the situation is much improved as compared with a few months ago. We quote for Chicago delivery:

Beams and channels, 3 to 15 inches, inclusive, 1.78c to 1.81c delivered Chicago. For extras see Pittsburg report. Quotations from store are as follows for carload lots and over:

All angles, 3 inches and larger, including 6 inches, $1.95 per 100 pounds; angles over 6 inches, $2.05 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.95 per 100 pounds, base; channels, 3 inches and larger, $1.95 per 100 pounds, base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—In this territory new contracts for standard section rails appear to have been pretty well exhausted for this year. Of the Baltimore & Ohio railroad tonnage 1,500 tons will be rolled at the Illinois Steel Co. mills. Western roads have come forward with very good specifications, however, one road taking its rails at the rate of 5,000 tons weekly. As a result of this, the leading producer has placed upon its books within the last few weeks rolling orders sufficient to carry it along until October. The demand for light rails continues very strong and since the first of the month the local Steel Corporation mills alone have been called upon for 1,300 tons. Prices of light rails also are stiffer and sales are now on the basis of $25 a ton, for the most part. We quote below the official schedule of prices which remains unchanged. The Chicago City Railway Co. placed an order for about 300 tons of special track work for the Archer avenue barns with the Lorain Steel Co. and 80 tons of tie plates with the Pennsylvania Steel Co. The former order involves an expenditure of about $28,000. The Pennsylvania Steel Co. also took a contract for 400 tons of tie plates for the Delaware, Lackawanna & Western railroad. We quote:

Standard rails, $28 f. o. b. mill, full freight to destination; light rails, 25-pound to 45-pound, $28; 20-pound, $29; 16-pound, $30; 12-pound, $31. Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; spikes, 1.80c to 1.90c; track bolts, with square nuts, 2.20c to 2.25c; with hexagon nuts, 2.35c to 2.40c. Small railroad and square boat spikes, 1.90c base, f. o. b. Chicago.

Cast Iron Pipe.—No lettings of importance were scheduled during the past week. The routine list of inquiries and orders was somewhat diminished in volume as well, though a number of small contracts were placed. The only municipal letting of any importance in prospect is 1,000 tons at Cheyenne, Wyo. Prices are steady and we quote for 4 to 6-inch pipe, $27; 6 to 16-inch pipe, $26; larger sizes, $25; gas pipe, $1 a ton higher.

Merchant Pipe and Boiler Tubes.—An encouraging and continually increasing volume of specifications characterize the trade in tubular goods, but no large undertakings requiring noteworthy tonnages of pipe come to light in this market.

We quote mill discounts, Chicago delivery, carload lots, as below. On steel pipe jobbers are allowed a concession of one point and 5 per cent additional from the schedule in force.

	—Steel—	
	Black.	Galv.
¼ to 6 inches, inclusive.....	73.2	63.2
7 to 12 inches, inclusive.....	70.2	55.2

BOILER TUBES.			
	Steel.	Iron.	Seamless.
2¼ to 5 in., inclusive....	63.2	50.2	50.2

Mill quotations on iron pipe are three points higher than the foregoing prices.

We have revised our prices from store, as below. A concession of one-half to one point from these prices is allowed by Chicago jobbers on carload orders shipped from local stocks. We quote for less than carload lots as follows:

MERCHANT PIPE.

	—Steel—	
	Black.	Galv.
⅛ to ¼ inch.....	65	49
⅜ inch	67	53
½ inch	69	57
¾ to 6 inches.....	73	63
7 to 12 inches.....	69	54

Store prices for wrought iron pipe, carload lots, from Chicago stock, are as follows: One-eighth to ¼-inch, 61; ⅜-inch, 63; ½-inch, 65; ¾-inch to six inches, 70; 7 inches to 12 inches, 67. Boiler tubes from store are unchanged at 60 off.

Wire Products.—Reports for the month of July covering the movement of wire nails show that the business this year in that month exceeded the same business last year. The buying of plain and barb wire is quite up to

expectations. Demand has been particularly heavy from the southwest, aided in part by the prospect of increased freight rates, effective Aug. 10. Prices are firmer and we quote:

Wire nails, $2.13; painted barb wire, $2.28; galvanized barb wire, $2.58; smooth annealed wire, $1.98; smooth galvanized wire, $2.28; polished staples, $2.23; galvanized staples, $2.53. Carload lots to retailers, 5 cents higher; less than carload lots, 15 cents higher.

Coke.—The small quantities in which purchases of coke are being made has not been sufficient to materially alter prices from the basis established at the time of making the large contracts which were closed some 60 days ago. There is little of interest in the local market and we quote for standard grades of Connellsville foundry coke $2.00 to $2.25 and for furnace coke $1.65 to $1.85 at the ovens.

Old Material.—The scrap iron market, whatever may be the logic behind it, presents an aspect of increasing strength. The rise in values which has taken place in the last few weeks has resulted from the ability of the local dealers to absorb all the offerings in this market and at the same time to hold their stocks for higher prices in the face of a weak situation from the standpoint of consumption. While this action has been criticised by consumers of scrap as prejudicial to the general processes of resumption, the situation is a perfectly natural one and, with the approach of fall, indications point to an increasing firmness of the market due to natural causes. Increased operations on the part of a local car wheel manufacturer have brought a limited inquiry for old car wheels into market, but sufficient to add material strength to the price, and it is reported that transactions around $16 have been recorded. Other prices also are higher and we note a sale of frogs, switches and guards at $14.75, and one of short rails at $14.80. The following scrap offerings by the railroads have been received: Chicago, Milwaukee & St. Paul, 1,075 tons; Atchison, Topeka & Santa Fe, 1,800 tons; Cincinnati, Hamilton & Dayton, 665 tons; and the Chicago & Alton, 100 tons of rails. We have revised our prices and quote, gross tons, in the first paragraph as follows:

Old car wheels	$15.50 to 16.00
Old iron rails	16.50 to 17.00
Re-rolling rails (3 ft. and over)	15.50 to 16.00
Old steel rails (3 ft. and under)	14.25 to 14.75
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	19.00 to 19.50
Frogs, switches and guards	14.25 to 14.75
Heavy melting steel	13.00 to 13.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$12.50 to 13.00
No. 2 R. R. wrought	11.25 to 11.75
Knuckles, couplers and springs	12.50 to 13.00
Shafting	16.00 to 16.50
Iron car axles	17.75 to 18.25
Steel car axles	16.50 to 17.00
Dealers' forge No. 1	10.00 to 10.50
Pipes and flues	9.50 to 10.00
No. 1 cast, 150 lbs. and less	12.75 to 13.25
No. 1 mill	7.50 to 8.00
Mixed busheling (Nos. 1 and 2)	7.50 to 8.00
Country sheet	5.00 to 5.50
No. 1 boiler cut	9.25 to 9.75
Boiler punchings	11.00 to 11.50
Cast borings	5.50 to 6.00
Mixed borings, etc	5.50 to 6.00
Machine shop turnings	6.75 to 7.25
Railroad malleable	12.00 to 12.50
Agricultural malleable	11.00 to 11.50
Stove plate and light cast scrap	10.75 to 11.25
Old iron splice bars	15.75 to 16.25

CLEVELAND.

More Interest in Ore—Fair Inquiry for Pig Iron—Cutting on Sheets.

Office of THE IRON TRADE REVIEW,
Browning Building, Aug. 11.

Iron Ore.—Iron ore companies report more interest on the part of some furnace companies and several blocks of 50,000 or 60,000 tons each have been sold, but the buying is still at a very moderate rate. Laborers on the ore docks at Superior and Marquette and at the coal docks at Ashland have gone out on a strike for an advance of 25 cents per day over the $1.75 which they are now receiving. Although the general policy of the vessel interests has been to pay the same wages as prevailed last year, some of the dock companies have reduced wages. The amount asked by the striking laborers is 25 cents less than is being paid by vessel interests at other points.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $5.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70, and Mesabi non-Bessemer, $3.50.

Pig Iron.—Inquiries have been very fair during the past week, but no business worthy of special mention is pending. A cast iron pipe interest at Massillon has purchased 3,000 tons for shipment at the rate of 150 tons per day, beginning immediately, on a basis of about $14.50 valley for No. 2, the company having purchased Nos. 2, 3 and 4. Indications are that the melt of foundries is slowly increasing. We quote as follows, f. o. b. Cleveland:

Bessemer	$16.55 to 16.65
No. 1 foundry	15.40 to 15.80
No. 2 foundry	15.25 to 15.50
No. 3 foundry	14.90 to 15.25
No. 2 southern	15.85 to 16.10
Gray forge	14.00 to 14.50
Lake Superior charcoal	19.50 to 20.00

Coke.—There is very little activity in the market. On contracts, we quote furnace coke at $1.65 to $1.80, and foundry coke at $2 to $2.25.

Finished Material.—The prevailing feeling seems to be somewhat improved. There is less dissatisfaction with prices, and although the buying is very moderate, it is for actual requirements. Specifications are coming in freely. Cutting on prices of sheets continues on the part of independent interests, and the principal producer has lost a great deal of business in the Cleveland territory. The bar iron business being received is about equal to half of the capacity of the local mills, whose running is intermittent.

Old Material.—Steel is firm, while rolling mill material continues to show weakness. Cleveland dealers are readily absorbing all local offerings, only outside points offering material at anything verging upon lower prices. In consequence, yards of local dealers are filling with all grades of steel material, while local mill owners still show a disposition to defer purchasing. Fair sized railroad lists have failed to break the market. Old iron rails have advanced 50 cents a ton and machine shop turnings and wrought iron drillings a like advance. We quote, f. o. b. Cleveland, as follows:

Old iron rails	$16.50 to 17.00
Old steel rails (re-rolling)	15.00 to 15.50
Old steel rails (under 6 ft.)	15.00 to 15.50
Old car wheels	15.00 to 15.50
Old steel boiler plate	12.50 to 13.00
Steel axles	18.00 to 18.50
Malleable iron (railroad)	13.50 to 14.00
Malleable iron (agricultural)	11.50 to 12.00
Heavy steel	14.00 to 14.50
Country mixed steel	12.00 to 12.50
Low phosphorus	16.00 to 16.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$12.50 to 13.00
No. 1 busheling	11.00 to 12.00
No. 1 machine cast	12.00 to 13.00
Iron axles	17.00 to 18.00
Axle turnings	9.50 to 10.00
Machine shop turnings	7.50 to 8.00
Grate bars	11.00 to 11.50
Pipes and flues	11.00 to 11.50
Tank iron	11.00 to 11.50
Hoop and band iron	8.00 to 8.50
Sheet iron	6.00 to 6.50
Wrought drillings	7.50 to 8.00
Stove plate	11.00 to 11.50
Cast borings	7.00 to 7.50

CINCINNATI.

Advance in Southern Prices Follows Heavy Buying.

(By telegraph.)

Cincinnati, O., Aug. 12.—A local steel mill bought 2,000 tons of basic resale iron. A local consumer has closed for 1,200 tons foundry. An inquiry for 2,000 tons of foundry iron is in from an Ohio melter, deliveries running into next year. Unsold ton-

nage on hand at southern furnaces is estimated at 70,000 tons, with 22 stacks in blast on foundry iron in that section.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., Aug. 11.

Pig Iron.—The liberal tonnage of Southern iron sold the preceding week, resulted in an advance in southern iron prices and $12.00 Birmingham for No. 2 foundry is now minimum and only a limited tonnage is available at that figure. Most of the producers have advanced their views to $12.50 Birmingham and have declined business at anything under this schedule. No sales have been reported, however, above $12.00 Birmingham, and this price limits the territory in which southern iron can compete with northern, as northern furnaces continue to take business at $14.50 valley furnace and $14.75 to $15.00 in Southern Ohio districts.

There is a fair inquiry, although no important transactions are under negotiation. A prominent stove manufacturer asks for prices on 2,000 tons for delivery over the remainder of the year. A local melter is in the market for 1,000 tons; and a Central Ohio manufacturer and large melter is in the market for foundry and high silicon iron. There are also a number of smaller inquiries under consideration. A Southern Ohio furnace has taken some business for the first quarter of next year at $15.00, and we note a sale of 1,000 tons on this basis. The southern furnace situation appears to be very strong in view of the orders taken, the number of furnaces in blast, and the increased cost of coke due to the strike in the Birmingham district, which has necessitated purchasing in the Wise county and Pocahontas districts of liberal quantities. The southern iron situation is decidedly stronger than northern furnaces appear to realize, as the northern situation has not responded to the advance in the south. It is believed that there is a slight increase in the melt of pig iron in this territory, as the call for foundry coke has been steady and showing a moderate increase. The advance in southern iron has not been in force long enough as yet to test the disposition of buyers in the territory still open to the southern producer as against northern iron. High silicon iron continues unchanged and remains at $18.50 for 8 per cent at Jackson county furnace. We quote for prompt delivery, delivered Cincinnati, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton as follows:

Southern foundry No. 1	$15.75 to 16.25
Southern foundry No. 2	15.25 to 15.75
Southern foundry No. 3	14.75 to 15.25
Southern foundry No. 4	14.25 to 14.75
Southern No. 1 soft	15.75 to 16.25
Southern No. 2 soft	15.25 to 15.75
Southern gray forge	14.00 to 14.25
Northern No. 1 foundry	16.70 to 17.20
Northern No. 2 foundry	16.20 to 16.70
Northern No. 3 foundry	15.70 to 16.20
Northern 8 per cent silicon	19.70

Finished Material.—The market remains unchanged with fair specifications on contracts although but little new business in the way of mill orders is being placed. The jobbing trade has shown improvement in the recent past and small orders are filled here at the following quotations, which are well maintained:

Iron and steel bars, 1.85c to 2c, full extras. Angles, 3 x 3 and over, 2.10c to 2.25c; beams and channels, 15 inches and under, 2.10c to 2.25c; small angles and architectural channels, 2c base; plates, ¼-inch and heavier, 2c; 3/16-inch, 2.10c; No. 8, 2.15c; sheets, blue annealed, No. 10, 2.15c to 2.25c; No. 12, 2.20c to 2.30c; No. 14, 2.25c to 2.35c; No. 16, 2.35c to 2.45c; box annealed sheets, Nos. 18 and 20, 2.55c to 2.65c; Nos. 22 and 24, 2.65c to 2.75c; Nos. 25 and 26, 2.70c to 2.80c; No. 27, 2.75c to 2.85c; and No. 28, 2.85c to 2.95c; boiler tubes, 2¼ to 5 inches, 62 per cent off base; turnbuckles, 45 per cent off; rivets, 3c base; cold rolled shafting, 47 to 50 per cent off list; steel tire, 2.05c to 2.10c base.

Coke.—The demand for prompt shipment, Wise county and Pocahontas coke, from the Alabama furnaces due to the strike in that district, has advanced prices of spot furnace coke to a basis of $1.85 to $2.00 which places prompt shipment coke on a higher basis than contract. In the Connellsville district, spot coke is relatively lower than contract. The trade in foundry coke is quiet, with but few contracts being made or under negotiation. Contract prices in the leading coke producing districts are as follows:

	PER TON.
Wise county furnace coke	$1.75 to 1.85
Wise county foundry coke	2.10 to 2.25
Pocahontas furnace coke	1.75 to 1.85
Pocahontas foundry coke	2.00 to 2.25
Standard Connellsville furnace coke	1.85 to 2.00
Standard Connellsville foundry coke	2.00 to 2.25
Connellsville district furnace coke	1.60 to 1.80
Connellsville district foundry coke	2.00 to 2.25

Old Material.—The market is firm, as there is considerable shopping among dealers, and it is said that some dealers are buying pig iron to cover contracts for scrap. While prices are not quotably changed, dealers are maintaining the following:

Old No. 1 R. R. wrought, net tons	$11.50 to 12.50
Cast machine and fdy., net tons	12.00 to 12.50
Old iron rails, gross tons	14.00 to 14.50
Old steel rails (re-rolling) gross tons	13.25 to 13.75
Old short lengths, gross tons	12.50 to 13.00
Old iron axles, net tons	16.00 to 16.50
Heavy melting scrap, gross tons	12.50 to 13.00
Stove plate, net tons	10.00 to 10.50
Wrought turnings	5.50 to 6.50
Cast borings, net tons	4.50 to 5.00
Car wheels, gross tons	13.50 to 14.50

Maynard French has engaged in the iron and steel business, under the name of Maynard French & Co., with offices in the First National Bank Bldg., Cincinnati. The firm is the agent of the Wisconsin Steel Company, of Chicago, and will do a business in light rails, plates, sheets, bar iron, etc.

NEW YORK.

Some Important Melters Beginning to Sound Pig Iron Market.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., Aug. 11.

Pig Iron.—The net result of developments in the eastern market during the past week has been to eliminate the weak spots. Following the extensive purchasing of southern iron reported a week ago, several producers have advanced quotations to $12.50, Birmingham, for No. 2 foundry. There is no longer any $11.50 iron to be had, and little iron can be bought at $12. Some little Virginia product for immediate shipment is available at the $14 level, but on extended delivery a considerably higher price is insisted upon, furnaces preferring to store their output rather than sell at current figures. Stacks adjacent to the New York district are finding no difficulty in disposing of their make at $16, furnace, though the situation is somewhat disturbed by the continued reports of low prices in the Pittsburg district. As has been the rule for some time past, the bulk of selling has been in New England. During the week, a large melter there took on between 5,000 and 8,000 tons of foundry at a price not announced, another important consumer bought up to 5,000 tons of malleable, and several purchases averaging about 1,000 tons each are reported. The malleable iron is understood to come from the Buffalo district. Along the Hudson river and in the New York tidewater territory, extensive deliveries of Buffalo iron are being made, close to 6,000 tons having been placed of late by one large producer on the basis of $15, furnace, or slightly higher. The strongest feature of the market lies in the fact that several very large melters are beginning to sound the situation with a view to taking on good tonnages. There is some inquiry for first quarter delivery, with sales up to 1,000 tons at

about $1 above the current level. We quote, tidewater delivery for the remainder of the year, as follows:

Northern foundry No. 1	$17.00 to 17.50
No. 2X foundry	16.50 to 17.00
No. 2 plain	16.00 to 16.50
No. 2 southern foundry	16.50 to 17.00
Malleable	17.50 to 18.00
Basic	15.00 to 15.50
Gray forge	15.25 to 15.75

Ferro-Alloys.—During the week several sales of 50 per cent ferro-silicon have been made, the aggregate being about 200 tons and the price about $69, Pittsburg. In ferro-manganese an inquiry is current for 1,500 tons for delivery early next year. For such forward shipment a considerable advance is being asked over the present level, $64 seaboard. The usual trade in ground materials is reported.

Finished Materials.—A constantly increasing tonnage of steel is involved in local building projects, but actual lettings of the past week have been few. The American Bridge Co. took a 2,000-ton mercantile building at Portland, Ore., the Fort Pitt Bridge Works secured an order for between 3,000 and 4,000 tons of bridge work on the Western Pacific, the receivers of Milliken Bros. took a large highway bridge for the Vanderbilt race course on Long Island, and the Pennsylvania Steel Co. secured the contract for the truss work on the Hotel Astor addition. This interest also took about 1,300 tons of plate girder work for the Pennsylvania Tunnel & Terminal Co., the Norfolk & Western and the Pennsylvania system. An encouraging development of the week is the extreme probability that the Equitable building project, requiring 40,000 tons of steel, will be pushed; it is known that work is to begin immediately for the shop drawings. Ravitch Bros. have the contract for the 800-ton apartment for the Allenel Contruction Co., and the Irving Iron Works will probably place the steel this week for the Union Theological Seminary, 800 tons. Bids have closed on a 900-ton hotel proposition in Boston, a 1,200-ton building at Thirty-fourth street and Madison avenue and on other important work. Decisions are expected any time on the Hoyt apartments in this city, the 3,000-ton office building at Nassau, Beekman and Ann streets, the Emigrant Savings Bank and the 300-ton extension to the Third avenue railroad car barns.

New York City will receive bids up to Aug. 19 on a big tonnage of 48-inch cast iron pipe, which letting will be followed by several others of imporance. Brooklyn is also expected to take definite action soon on the 10,000 to 20,000-ton undertaking which has been up several times before. The Boston letting of 48-inch pipe went to the Warren Pipe & Fdy. Co. at $22.40, delivered, about 4,000 tons being involved. The McWane interests took 350 tons for New Windsor, Md., and 270 tons for Washington. The Utica Pipe Fdy. placed 200 tons at Brookfield, Mass.

A moderate run of business in plates is reported. On the Amityville extension to the Brooklyn water system, bids on which went in some 10 days ago, the letting has been tied up temporarily by injunction proceedings restraining the award to the East Jersey Pipe Co., which offered to install lock bar pipe at $19.90 per foot. The Ryan-Parket Construction Co. was low on riveted pipe at $20 per foot, the other bids running up to $24.85. Specifications call for about 83,300 feet of 72-inch steel pipe, for which some 16,000 tons of plates will be required, if lock bar is used, or 21,000 tons if riveted pipe is accepted.

A bar iron inquiry of 300 tons is current, delivery to run over the next three months. Early shipment bars are still easy, but on forward delivery mills are not eager for business at the present level. Prices have stiffened considerably and mills are running in better shape. We quote: Angles, 3 to 6 inches x ¼-inch and heavier, 1.76c; beams, 3 to 15 inches, 1.76c; tees, 3 x ¼-inch and heavier, 1.81c; plates, carloads, tanks, 1.76c; marine boilers, 2.16c; bar iron, 1.46c; soft steel bars, 1.56c; sheets, No. 28, black, 2.66c.

Old Materials.—There is a moderate volume of business in limited lots of various lines, chiefly low priced scrap. The railway lists for August are not large as a rule, but carry considerable items of old steel rails. Old iron rails and wrought turnings are slightly higher. Mills are still operating lightly and are not willing to pay the prices demanded by dealers. We quote, gross tons, New York delivery, as follows:

Old iron rails	$14.50 to 15.00
Old steel rails, re-rolling	14.00 to 14.50
Relaying rails	20.00 to 21.00
Old car wheels	12.00 to 12.50
Old iron car axles	17.50 to 18.00
Old steel car axles	16.00 to 16.50
Heavy melting steel	12.00 to 12.50
No. 1 railroad wrought	14.00 to 14.50
Iron track scrap	12.50 to 13.00
Wrought pipe	10.00 to 10.50
Cast borings	6.50 to 7.00
Wrought turnings	8.50 to 9.00
Heavy cast scrap	12.50 to 13.00
Railroad malleable	10.00 to 10.50
Stove plate	9.50 to 10.00
Grate bars	9.50 to 10.00

The Genesee Furnace Co., Charlotte, N. Y., has blown in its stack, which was recently relined.

PHILADELPHIA.

Progress Toward Normal Conditions is Very Slow.

Office of THE IRON TRADE REVIEW,
408 Central Trust Bldg., Aug. 11.

Pig Iron.—With furnaces having about sold to their capacity for third quarter shipment and a general advance of 50 cents a ton asked for fourth quarter delivery, pig iron may be said to be much nearer a basis of $17 for No. 2X as a bottom figure. The market continues its moderate pace and so far has not justified the expectations expressed recently in some quarters that August would develop a buying movement. Buyers are said to maintain a conservative attitude both in inquiry and in their ordering. But in spite of the seeming holding back there is a slow but sure, if somewhat irregular, increase and progress from week to week. The past week, which may be said to have played its part in this program but indifferently well, shows nothing startling or unusual. Virginia irons are selling at $16.50 to $16.85 Philadelphia. Southern is still $12 Birmingham. We quote as follows, f. o. b. Philadelphia:

No. 1X foundry	$17.00 to 17.50
No. 2X foundry	16.50 to 17.00
No. 2 plain	16.00 to 16.50
Standard gray forge	15.25 to 15.50
Basic	15.25 to 15.50
Low phosphorus	21.00 to 21.50
No. 2 Birmingham	15.75 to 16.25
No. 2 Virginia	16.75 to 17.00

New Material.—While one of the steel mills reports quite a considerable run of orders for heavy structural shapes, bars and drop forgings, the market for the most part is featureless and the thought seems to be that a resumption of business depends largely on general buying by the railroads. Prices are as follows: Structural, 1.75c to 1.90c; steel plates, 1.75c to 1.80c; refined iron bars, 1.35c to 1.45c; steel bars, 1.55c.

Old Material.—The market is quiet with dealers tending to hold for better prices and the mills disposed to buy at the bottom figures quoted, and some at the higher prices. We quote as follows:

Old steel rails (re-rolling)	16.00 to 16.50
No. 1 steel scrap	14.50 to 15.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 23.00
Old iron rails	18.25 to 18.75
Old car wheels	14.50 to 15.00
Choice scrap R. R. No. 1 wrought	16.25 to 16.75
No. 1 yard scrap	14.50 to 15.00
Machinery scrap	15.00 to 15.50
Low phosphorus scrap	18.50 to 19.00
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire scrap	12.00 to 12.50
No. 2 forge fire scrap, ordinary	9.00 to 10.00
Wrought turnings	8.50 to 9.00
Axle turnings, heavy	12.00 to 12.50
Cast borings	9.25 to 9.75
Stove plates	12.00 to 12.50

BUFFALO.

Limited Inquiry for Pig Iron—Finished Lines Dull.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Aug. 11.

Pig Iron.—All along the line business was reported quiet this week by the local furnace men and those representing valley furnaces. The call is for small tonnage and the large consumers made few inquiries. The greater part of the present demand is from eastern offices of furnace companies, which send here for tonnage, there being more activity in the east. Prices have not changed this week. We quote, f. o. b. Buffalo, as follows:

No. IX foundry	$16.00 to 16.50
No. 2X foundry	15.50 to 16.00
No. 2 plain	15.00 to 15.50
No. 3 foundry	15.00 to 15.50
Malleable Bessemer	16.00 to 17.30
Gray forge	14.75 to 15.25
Charcoal	20.25 to 20.75

Finished Products.—The market is full of rumors of business, but nothing in the way of large contracts has been closed. The impression given by the concerns represented here is that the week past was unusually quiet.

ST. LOUIS.

Prices of Southern Pig Iron Advancing—Inquiries Numerous.

Aug. 11.

Pig Iron.—Prices on pig iron showed a mark tendency to advance in the St. Louis territory last week. The Sloss people, who instructed their agents a month ago to sell low grade iron at $11.25 will not now sell No. 2, Birmingham, at less than $12.50. The $11.25 price is understood to have applied to a special lot of iron, probably of a high sulphur quality, but sales were freely made at $11.50. Inquiries for 100 to 500 tons lots were quite numerous last week and in today's mail, and some No. 2 is said to have been sold for $13. Part of the buying movement is believed to be due to influences in Birmingham, and because of the reported heavy purchases by cast iron pipe and other large consumers in the South and Central West during the last few days.

Our quotations delivered, to which $3.75 freight from Birmingham has been added, follow:

No. 1 southern	$16.25 to 16.75
No. 2 southern	15.75 to 16.25
No. 3 southern	15.25 to 15.75
No. 4 southern	14.75 to 15.25

Coke.—There was also an increased demand for coke last week, some of the ovens advancing their prices for extended deliveries but not for prompt shipments. Our quotations remain at $2.15 to $2.50 for the best selected 72-hour Connellsville foundry, f. o. b. ovens; $1.60 to $2 for best selected Connellsville 48-hour furnace ovens, with West Virginia and Virginia unchanged. The freight rate to East St. Louis is $2.80 and to St. Louis $2.90, but on and after September 1, the rate from Virginia and West Virginia coke fields of $2.80 to East St. Louis will be applicable to St. Louis, the railroads having agreed to absorb the bridge toll of 30 cents a ton.

Finished Material.—Impetus was given to the structural iron market last week by the completion of arrangements for the erection of a 10-story brick and steel frame building for the Roberts, Johnson & Rand Shoe Co., to cost $500,000. Plans were perfected by the real estate office of the Mississippi Valley Trust Co. Architect Isaac Taylor has also notified A. J. O'Reilly, president of Board of Public Improvements, that plans for the proposed $1,500,000 municipal building are so near completion that arrangements should be made to begin boring for the foundations.

Old Material.—Scrap iron orders have been coming in in increased volume, due, it is believed, to the repairs ordered by railroads to their rolling stock because of reports of improved crop conditions. Prices have advanced slightly on some articles. Our quotations follow:

Cast iron borings, free from foreign material, net ton	$ 5.00
Steel axle turnings, net ton	8.00
Steel railroad axles, net ton	$17.00 to 18.00
Iron railroad axles, net ton	18.00 to 19.00
Miscellaneous steel scrap, gross ton	9.75
Old car wheels, gross ton	14.00 to 14.50
No. 1 railroad cast scrap, net ton	11.50 to 12.00
Heavy machinery cast, net ton	12.50
Stove plate and light cast, net ton	9.00
Sheet iron, net tons, uncut	3.50
No. 1 railroad wrought, net ton	10.00 to 10.50
Railroad malleable, net ton	11.00
Heavy melting steel, net ton	11.00

BIRMINGHAM, ALA.

Strike Causing Little Trouble for Iron Manufacturers.

Aug. 10.

There is a steady selling of pig iron in Alabama and the manufacturers all report improving conditions in every direction. The lowest quotation is on a $12 basis, No. 2 foundry, and some of the larger companies are not willing to accept under $12.50 per ton. There is a healthy outward movement of the product, while the home consumption is holding up and even improving.

According to the present plans two furnaces are to go into operation during this week, the Alabama Consolidated Coal & Iron Co. to blow in one and the Sloss-Sheffield Steel & Iron Co. to start up the Lady Ensley furnace at Florence. Three other furnaces are being worked on and will be started up just as soon as conditions warrant it.

The strike of the coal miners continues to give a little trouble in this district, but coal and coke are being brought into the district from Tennessee and West Virginia and the iron production is not being interfered with in the least. The manufacturers are confident that within a short time they will have whipped out the strike and demonstrated clearly that they propose to operate their mines as they see fit and on the open shop plan.

Cast iron pipe plants in the Birmingham district are melting a larger amount of iron now than ever before.

The opening of an office in Birmingham by Matthew Addy & Co. is taken as a very significant move. Mr. Boyken is in charge of the office. Some years ago this firm had an agent here but he became sick and moved from the city and no permanent office was left here, representatives, however, visiting the Birmingham district often.

BRITISH IRON MARKET.

Trade Seems to Be at Lowest Ebb—Little Prospect of Improvement.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., July 25.

This week has shown no improvement on its immediate predecessors. The market continues extremely depressed, and nearly all sections of trade share in the dullness. The meeting on the local market was marked by no special features, and iron masters will welcome the excuse afforded by the August holidays for shutting down. Smelters continue to "bank" iron and will continue to do so as long as their stock reserves will bear the strain. They are in a somewhat better position this week, and, though not yet producing iron at a profit, their loss per ton has been reduced by several shillings. On all hands, it is agreed that there is little hope of any material revival before autumn, but it is thought that the gathering of the American and Canadian harvests and the relatively smaller harvest of this country, which usually give an impetus to the trade of this country, will exert their usual influence. Cleveland prices remain comparatively firm, and yesterday's figure was 49s 6½d ($12.13), as compared with 49s 10½d ($12.21) the previous day. The firmness of this market is causing some surprise, for it is subject to keen competition from other districts. Business in East

Coast hematite is extremely dull, and the outlook is far from encouraging, for the industries which consume this product are depressed to an unusual extent and there seems little likelihood of an early revival. Stocks of iron at Middlesbrough are increasing daily. On July 1 the stocks amounted to 47,949 tons, the lowest recorded since 1900, but there has been a steady increase ever since and they now amount to 52,970 tons. Generally speaking, it may be said that the trade appears to be at the lowest possible ebb. From Lincolnshire comes the news of a reduction in the price of foundry pig iron by 1 shilling on No. 3 foundry, and 1s 6d on No. 4 foundry, making the figures respectively 46s 6d ($11.38) and 45s 6d ($11.14) per ton. Smelters in this district are still unable to obtain any relief from the existing high rates of fuel, colliery proprietors refusing all concessions.

METAL MARKET

CHICAGO.

Aug. 11.

The past week has witnessed an approach to almost normal buying conditions. Consumers of copper, in particular, have placed contracts covering future requirements to a very considerable extent. Prices generally have advanced and we quote for delivery in small lots as follows:

Lake copper, 14¼c to 14½c; casting, 14c to 14¼c; pig tin, 33c to 33½c; spelter, 5c to 5.10c; pig lead, desilverized, 4.75c to 4.90c in 50-ton lots; corroding, 4.90c to 5c in 50-ton lots; car lots, 2½c per 100 pounds higher; sheet zinc, 7c list, f. o. b. LaSalle, in car lots of 600-pound casks; Cookson's antimony, 11c to 11½c; other grades, 10c to 10½c.

The metal market generally has influenced a better situation in the scrap metals, but the pulse of trade in this direction is less active and prices remain as a week ago. We quote to dealers as follows:

Copper wire, 11½c; heavy copper, 11½c; light copper, 10¾c; heavy red brass, 10¾c; heavy yellow brass, 8½c; light brass, 6½c; No. 1 red brass borings, 8½c; No. 1 yellow brass borings, 7¾c; brass clippings, 8½c; tea lead, 3½c; lead scrap, 3¾c; zinc, 3.10c; tin pipe, 25c; tin foil, 20c; pewter, 18c; electrotype plates, free from wood, 4⅛c; electrotype dross, 2¾c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc, $55 per ton.

NEW YORK.

Aug. 11.

Copper.—With business on a more extensive scale than at any time since last October, copper prices have steadily advanced and the market has assumed unusual strength. The fact that buying is being done by practically all classes of consumers indicates that the movement is based on substantial improvement in manufacturing generally. Sellers have been pushed to care for the volume of business pouring in upon them. We quote: Lake, 13¾c to 14c; electrolytic, 13⅝c to 13⅞c; casting, 13⅜c to 13⅝c.

Pig Tin.—The market has been only moderately active, transactions being limited to early delivery metal on which a considerable premium prevails. The price level ranges between 30.50c and 31c.

Pig Lead.—Brisk purchasing during the past week, both on actual and speculative account, has sent prices up to from 4.57½c to 4.62½c., with the tendency still upward.

Spelter.—The clearing out of extensive Western stocks, a process carried on so quietly as to escape general attention, has given the market a stronger tone. Brisk trading is current at from 4.70c to 4.75c.

Antimony.—We quote: Cookson's, 8½c; Hallett's, 8⅜c; ordinary brands, 8c to 8¼c.

ST. LOUIS.

Aug. 11.

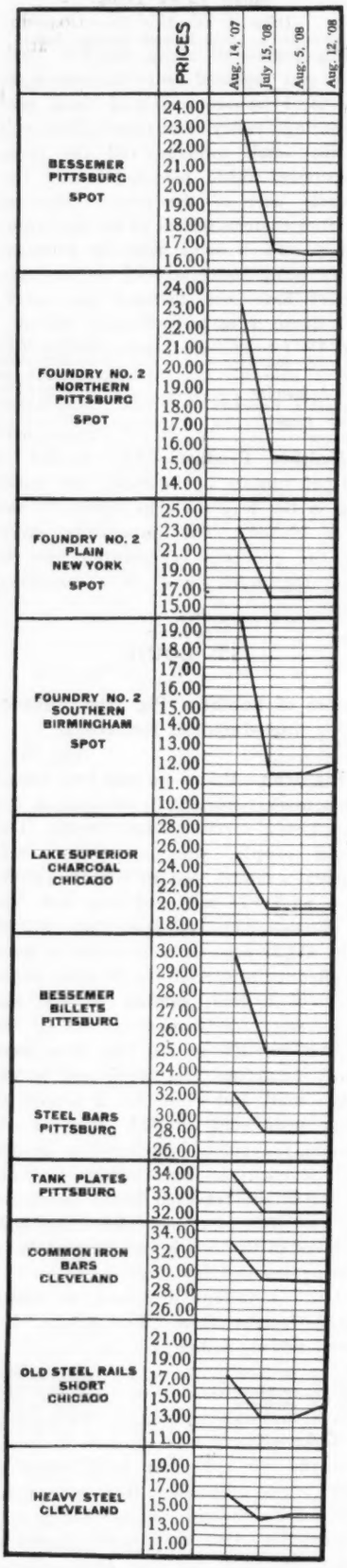
Lead and Zinc.—Lead and zinc took on a bullish movement in the Joplin district last week, the former reaching a basis of $36.50 for 60 per cent ore, and a top notch price of $39.50, while the latter went up to $63.50 a ton, with numerous sales recorded at $62 a ton. The shipments were heavier than for some time, production having received considerable stimulus from the advancing market.

Zinc ore started at $35 a ton bid for 60 per cent ore at the beginning of the week, which moved up to $36 Wednesday under pressure of stanch holdings by producers, closing the week with a sale of $36.50 as a base price. The low grade ores also responded to the upward tendency.

Lead ores also felt the advance until they reached the $63.50 mark, although the more general price paid was $62.

The Boston branch of the National Metal Trades Association will have an outing in the harbor next week, in place of the regular monthly meeting and dinner at the Exchange club.

PRICE CHART.



NEW SHEET MILLS.

Hazelton, Pa., Company will Start Galvanizing Plant Aug. 15.

The Hazelton Sheet Steel Co., Hazelton, Pa., will begin the operation of its galvanizing plant about Aug. 15. The company already has three hot mills in operation. L. C. Taylor, of Cambridge, O., formerly with United Sheet & Tin Plate Co., Marietta, O., was the organizer of the company, and the plant was built under his direction. The rolling mill is housed in a building 110 x 250 feet, containing four hot mills, two cold mills, four sheet furnaces, four pair furnaces, four annealing furnaces, two steam doublers, a 25-ton traveling crane, and a 1,200-horsepower Corliss horizontal engine. A building 62 x 240 feet contains the roofing and galvanizing department. The power plant is equipped with a 150-horsepower automatic engine and generator, four boilers and two Duff patent gas producers. A portion of the equipment comes from the dismantled Tuscarawa works of the United Sheet & Tin Plate Co., Newcomerstown, O. The estimated capacity of the plant is 16,000 tons of black and galvanized iron and steel sheets, blue annealed and electric sheets, steel roofing and corrugated sheets, conductor pipe, eave trough, etc.

The officers of the company are: President, E. Cooper Shapley, attorney and director of the Commonwealth Trust Co., Philadelphia; general manager, L. C. Taylor; manager of sales, John N. Remsen, formerly with Follonsbee Bros.' Sheet and Tin Mills, Pittsburg; superintendent, W. A. Householder, formerly manager American Sheet & Tin Plate Co., Chester, W. Va.; assistant superintendent, Ira Householder, formerly assistant superintendent American Sheet & Tin Plate Co., Chester, W. Va.; paymaster, Charles K. Stitler, formerly with the Vandergrift's works of the American Sheet & Tin Plate Co.; mill clerk, J. Sherman Taylor, Cambridge, O.; office clerk, Frank Koenig, Hazelton, Pa. The main office of the company is located at 318 Stephen Girard building, Philadelphia.

Plan of Lackawanna Foundries.—In a handsome booklet just issued by the Lackawanna Foundries, recently organized with $200,000 capitalization to take over a foundry at Dover, N. J, for the manufacture of iron, brass and artistic bronze castings, the plans of the new corporation are announced. The foundry building is 40 x 160 feet, with a lean-to 18 x 40 feet, and the plant includes an office and shipping building, all fully equipped, the gray iron molding capacity being about 15 tons per day. The plant is served by two railroads and is only 40 miles from New York. George Pierson is president of the new company; Henry E. Dixey and Leslie C. Hillard, vice presidents; J. H. Hurlbutt, treasurer, and John D. Brooks, secretary. The directory board is made up of the officers, together with H. B. Swart and James W. Kent. Prof. Ora W. Knight, chemist for the state of Maine, is chemist and metallurgist.

STEEL FOUNDRIES REPORT FOR PAST ELEVEN MONTHS.

The American Steel Foundries has issued a report to the New York stock exchange covering the 11 months ended June 30, 1908. The income account for the eleven months, compared with the fiscal year (12 months) ending July 31, 1907 and 1906, shows as follows:

	11 months, June 30, '08.	12 months, July 31, '07.	12 months, July 31, '06.
Net after operating expenses, etc.	$607,134	$2,893,642	$1,526,937
Other income	110,585	206,964	70,018
Total net earnings	$717,719	$3,100,606	$1,506,955
Charges sinking fd. depreciation, etc.	617,142	721,509	587,433
Surplus	$100,577	$2,379,097	$1,009,522

The balance sheet of the company and the subsidiary companies, as of June 30, 1908, based on new capitalization, and the balance sheets of July 31, 1907 and 1906, compare as follows:

ASSETS.
(After readjustment.)

	June 30, '08.	July 31, '07.
Real estate, buildings, etc.	$19,883,727	$34,231,622
Add. and imp.	.....	462,173
Real estate not used	298,630	298,620
Sinking fund, cash and accrued interest	11,440	.....
Securities	671,818	616,209
Inventories	1,637,909	1,583,179
Accounts and bills receivable	775,228	3,795,026
Collateral time loans	1,900,000	.....
Cash	1,521,735	770,423
Prepaid insurance	45,409	61,822
Totals	$26,745,897	$41,819,082

LIABILITIES.

Capital stock	$17,184,000	.....
Common stock	.....	$17,240,000
Preferred stock	.....	15,810,000
Bonds	6,695,800	3,411,000
Bills payable	.....	.....
Accounts payable	989,564	1,079,191
Pay roll account	53,414	159,019
Accrued interest	113,497	75,576
Deprec. reserve	951,022	770,040
Sinking fund, etc.	142,504	.....
Pay to old pfd. stockholders	515,520	.....
Profit and loss account	100,577	3,274,256
Totals	$26,745,897	$41,819,082

The next meeting of the Central Association of Stove Manufacturers has been called for Sept. 15, at Columbus, O. Secretary Williams says that his reports from the stove manufacturers show that as yet they are not adding to their working force.

LONGER WORK HOURS.

Are Being Established in Indiana Machine Shops and Foundries.

Indianapolis, Ind., Aug. 8.—Several of the largest cities in the country are preparing to do their own asphalt street patching in the future. Hetherington & Berner, of this city, have just received contracts for such plants from the cities of San Francisco and Seattle and recently completed one for Indianapolis. The first municipal asphalt plant in the country was built by this company several years ago for Detroit.

The L. S. & M. S. railroad last week put its shop at Elkhart on a 49-hour schedule, instead of the 36-hour week schedule in effect for some time. About 500 men are affected and the shops have enough work to keep them busy for some time.

The Pennsplvania railroad shops at Logansport are now working 10 hours a day after having worked five hours a day for some months. The shops have received 200 freight cars for repairs that are needed for moving the crops.

The Continuous Water Power Machine Co. has arranged for the site formerly occupied by the Kelley Ax Co. at Alexandria, and will begin operating as soon as the necessary equipment can be obtained and installed. The Industrial club has agreed to give the company a bonus of $25,000 when its plant is ready for operating, the company agreeing to establish a $60,000 plant and employ several hundred men.

Sloss-Sheffield Statement.—A statement of the Sloss-Sheffield Steel & Iron Co.'s working capital as on Nov. 30, 1907, not published heretofore, shows as follows:

Cash, bills and accounts receivable		$1,399,086
Raw and finished material on hand, at cost		543,737
Merchandise and supplies in company's stores and warehouses, at cost		235,111
Insurance and taxes unexpired		6,285
Treasury, securities, stocks and bonds, at market value		513,476
Total		$2,697,696
CONTRA.		
Pay rolls (current month)	$ 77,350	
Accounts payable (current accounts)	527,897	
Loans	200,000	
		805,247
Balance working capital in business		$1,892,449

Thomas L. Dickinson has purchased the business of manufacturing diamond tools and points carried on for a number of years at 64 Nassau street by his father, the late John Dickinson. The establishment of this concern dates back to 1796.

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RECORD IRON AND STEEL EXPORTS.

Full details of our iron and steel export statistics for the fiscal year ended June 30 last, are given elsewhere in this issue. The value of all iron and steel exported broke all records for a fiscal year, being $183,982,182, against $181,530,871 in 1907 and $160,984,985 in 1906. The value in the fiscal year 1908 is almost double that in 1903, only five years earlier.

It may be early to generalize, but it can be stated positively that the records to date show no signs whatever of "dumping." This is shown clearly by the fact that while the total value in the fiscal year 1908 shows a slight increase from 1907, and a large increase from 1906, the tonnage of those lines which are returned by weight shows a decrease in 1908 of 5.5 per cent from 1907 and of 12.8 per cent from 1906. Nearly all lines of machinery, which of course are not included in the tonnage statistics, show a slight decrease in point of value, indicating that there was a material increase in the value of the tonnage lines, although the actual quantity underwent some decrease.

The increase in the value of the tonnage lines, which run from scrap and pig iron on through to structural material, pipes and fittings, nails, etc., is due partly to increased valuations per ton and partly to an increase in the average degree of finish. Thus scrap, pig iron, crude steel, wire rods and rails show a decrease in tonnage, while such more finished forms as structural material, pipes and fittings, hoops and bands and tin plates show an increased tonnage. Rails show a materially higher valuation per ton, so that, while the tonnage decreased 4 per cent, the total value increased 5 per cent.

The iron and steel exports now being made are of a totally different character from those sometimes made in years gone by, when pig iron and rails were dumped because there was an entirely insufficient demand in the domestic market. The new export movement had its inception in the calendar year 1904. Following a period of intense activity in 1902 and the early part of 1903, when all capacity was fully engaged, there came a very decided slackening in the domestic demand, although much new capacity was still to be completed. Active efforts were at once made to build up a larger export trade. At the start, orders were taken for the cruder materials, but a constant effort was made to sell the more finely finished materials, and a real trade was built up, which was so valued that often in 1906 and the fore part of 1907 orders were accepted not because they were wanted but because it was worth the while to suffer an inconvenience in filling them in order to hold the trade. The present trade is chiefly in finished steel products. In the past fiscal year, the exports of crude steel, including billets, sheet bars, etc., amounted to only about 8 per cent of the total tonnage exports, being exceeded by the individual lines, rails, structural material, sheets and plates, wire and pipes and fittings. Even rails are being left relatively in the background, as our exports of wire, wire nails and pipes and fittings combined have for two years exceeded the rail exports.

British iron and steel exports are showing a very material decline. The tonnage figures have declined from 2,792,038 tons in the first six months of 1907 to 2,148,055 tons in the first six months of this year, while the total value of the same items decreased from £24,003,869 to £19,454,287. Although these figures cannot be compared directly with the figures of our own commerce, on account of the difference in the periods covered, the indication is that we have suffered very much less from the world-wide industrial depression than has the United Kingdom.

BRITISH PATENT LAWS AND AMERICAN MANUFACTURERS.

With less than two months yet to elapse before the new English patent law becomes effective, the announcement that no mitigation of its provisions in favor of any country need be expected renders it practically certain that a large number of American manufacturers are to suffer severely through the efforts of a liberal administration to win the political favor of the working class. The essential feature of the new law is its provision for the revoking of a patent unless manufacture under it is carried on "to an adequate extent in the United Kingdom." The measure is aimed primarily at German manufacturers of chemicals and aniline dyes, who have been supplying the British market with German products, but incidentally it affects numerous lines of American manufactures, notably electrical and other machinery, typewriters and cash registers.

While the sponsors of the new law would have it regarded as a measure of retaliation, on the ground that Germany, France and other commercial countries require the home working of patents, there is gross injustice in this claim, inasmuch as the United States has no such provision in its patent regulations. Pressure has been brought to bear on the proper British authorities, both by

commercial and diplomatic forces of America, to secure the exemption which equity would seem to demand, but these efforts have been fruitless. The conclusion naturally follows that only selfish motives are to be attributed to the stand of Great Britain, which has registered with us only about one-third as many patents as American inventors have registered in that country.

There is still some doubt as to what interpretation will be placed on the term "to an adequate degree" in the new law and some relief may come to American holders of patents through a liberal course of procedure in this regard. However, several American manufacturers have already begun the erection of British factories at heavy cost, and others, unable to pursue such a plan, are becoming reconciled to the idea of losing their patents. With the aim of retaliation at the British provision, at least five measures were introduced at the last session of Congress, but action was withheld at the request of the Commissioner of Patents, who believed favorable terms could be secured by a commission sent abroad on such a mission. This commission is still at work. If its efforts fail, retaliatory measures of pronounced character can be expected at the next session of Congress and will certainly be well deserved.

NEW YORK'S FREIGHT CONGESTION.

Attention is called to the appeal of Mr. W. J. Wilgus, made in another column of this issue, for definite information on re-distributed freight in New York City as a basis for planning badly needed improvements in the freight transportation facilities of this congested district. Mr. Wilgus was formerly vice president of the New York Central system and has undertaken this work at the request of the Public Service Commission. Information of the sort requested can be given with the assurance that it will be used intelligently and held in strict confidence. It is possible that the result may be a plan whereby the bulk of freight distribution on Manhattan Island will be by an underground system, as is now being perfected at Chicago. At any rate, the need for improvement is imperative, and we urge, on behalf of Mr. Wilgus, the earnest and immediate co-operation of all affected concerns in the New York district.

A Very Important Factor.—Probably foremost among the vital forces that are making and keeping financial affairs in a progressive state over this dull period is that marvelous conception and unequaled success in business management for which the United States Steel Corporation has become so celebrated, advertising everywhere at a very high standard the country's capabilities as a place for money-making, and, consequently, for capital investment.—*Commercial and Financial Chronicle.*

The index for Vol. XLII of THE IRON TRADE REVIEW for the six months ending July 1 is now ready and will be sent to those subscribers who request it. The index will be sent without request to those who have formerly expressed a desire to have it.

IMPORTANT INFORMATION WANTED.

With the aim of providing some immediate method of relieving the freight transportation factilities on lower Manhattan Island, where traffic has reached a state of acute congestion, the New York Public Service Commission is now endeavoring to obtain data on which an accurate estimate of the total tonnage of freight re-distributed for consumption in the city can be based. This work is in charge of W. J. Wilgus, 165 Broadway, formerly vice president of the New York Central, who asks the co-operation of IRON TRADE REVIEW readers in New York City in securing the information. The nature of this is made clear in the following letter, prepared for circulation among iron, steel and machinery concerns carrying on a re-distributing business in New York City:

At the request of the Public Service Commission of the first district, I have made a report on the so-called West Side problem for treating the freight tracks of the New York Central and Hudson River Railroad Co. between Spuyten Duyvil and St. John's Park, and in doing so I have made suggestions for a broad plan of improvement in methods of handling freight traffic on lower Manhattan Island.

It is probable that this report will receive the attention of the commission in September, and in the meantime it is desirable that reasonably accurate statistics should be gathered, showing the tonnage of freight of all kinds handled on Manhattan Island. I have secured from the water and rail carriers the tonnage of inbound and outbound freight, but there is no well defined source through which I can obtain the percentage of the inbound tonnage that is re-distributed for consumption in Manhattan.

May I therefore ask if it will be possible for you to give me the following information:

(1) Approximate inbound tonnage of your business per annum re-distributed in Manhattan.

(2) If you have no records that will enable you to give me the information requested in (1), will you kindly keep an account of your inbound tonnage re-distributed in Manhattan for a period of 10 days, and give me the result?

If a record does not give the tonnage at the most prosperous period of your business, please state the percentage of increase from the tonnage at present.

I assure you that the information above requested is to be used for the best interests of the city and of its shippers, and that it will be treated as strictly confidential, the names of the firms not to be used in the published data.

The necessity of some early improvement in freight transportation facilities on Manhattan Island is so self-evident that Mr. Wilgus expects the co-operation of all progressive concerns whose interests are involved. The information requested may be sent to THE IRON TRADE REVIEW. It will be forwarded to Mr. Wilgus and held in strict confidence.

Canadian Pacific Strike.—The threatened strike of the Canadian Pacific railway machinists throughout Canada became a fact Aug. 5, it being estimated at Winnipeg, the union headquarters, that fully 12,000 men are out. The machinists in western Canada have a dispute with the railroad over a new schedule drawn up by the conciliation board which the men refuse to accept. The eastern men went out on strike in sympathy.

The United States board of general appraisers has overruled protests of Cambell & Gardner, Robert Reiner and S. Blumenthal & Co., to the extent that machinery parts are dutiable at 45 per cent as finished castings and not at eight-tenths of one cent per pound, as claimed in the protests.

The American Steel & Iron Co., Norwalk, O., started its mill on double turn Aug. 8, and announces excellent prospects for business for the immediate future.

The first shipment of 13,000 tons of iron ore for the Hamilton Iron & Steel Co.'s new stack at Hamilton, O., arrived Aug. 4, via Toledo.

The St. Louis & San Francisco has placed an order with the American Car & Foundry Co. for repairing 1,000 miscellaneous cars.

CHICAGO AND NORTHWESTERN R. R. TERMINAL AT CHICAGO

The first official information to be given to the public by the Chicago & Northwestern Railroad concerning the construction of its new $20,000,000 terminal buildings and steel track approach at Madison and Canal streets, Chicago, has just been obtained. The terminal depot, to be erected at an approximate cost of $4,000,000, will be one of the splendid architectural features of the city. The steel required in the construction of this building and more particularly in the elevation of the entering tracks will amount to over 40,000 tons, which fact affords some idea of the magnitude of the improvements. Capacity will be provided for handling 250,000 people every 24 hours and practically ten acres of floor space will be devoted to public use. With the exception of the South station at Boston, it will be the largest railway terminal in the United States, and it is expected that it will be ready for occupancy in January, 1910.

The plans call for an elevated terminal, reached by two elevated approaches of four tracks each, known as the north and west approaches, and a train shed 840 feet long and 320 feet wide that will contain 16 tracks, each with a capacity of 15 cars.

The approaches alone to this structure embrace some 30 acres of ground, 15 acres for the north and an equal amount for the west approach. This is entirely separate, and in addition to the present main lines.

Between Kinzie street and Madison street and Clinton and Canal streets some 13 acres will be occupied by the tracks and station. The area of the basement is over two acres; the street floor of the station building is 1¾ acres; the train shed six acres.

The new terminal will occupy practically four entire city blocks, bounded by Madison street on the south, Kinzie street on the north, Clinton street on the west and Canal street on the east, passing over Washington and Randolph streets by means of subways. The white enameled tile with which the subway is lined, and the brilliant arrangements made for its electric lighting, make it one of the most attractive features of the structure.

To acquire this property has taken months of time and several millions of dollars and the lack of friction accompanying these negotiations is a marked tribute to the liberal policy and fairness of this railroad. The task of removng the buildings on the site of the terminal has been tremendous, but at this time fully 80 per cent of the buildings is removed from the west approach, about 90 per cent from the site of the depot and in a mile and one-eighth along the north approach only seven or eight buildings remain.

The new terminal will be a structure of classic design, the essential feature of which is a great colonnaded entrance or portico of lofty proportions, monumental in type, with a height of 120 feet above Madison street. Before this front is a broad esplanade from which will rise the granite columns that guard the inner vestibule. The esplanade will be lighted by monumental bronze lamp standards, on which will be clusters of electric lights; and four clock dials, each 12 feet in diameter, will be on the walls.

There are six other public entrances to the building. The plan of the building provides for the street level; second, the train shed level, or main floor; and above this, a third floor, containing several features such as rest rooms and emergency rooms for the care of invalids.

Announcement was made in THE IRON TRADE REWIEW in the week of July 19, of the letting of the first contract for steel for the new terminal work, a contract for 750 tons to be used in connection with raising the tracks of the Oak Park Elevated R. R. where they cross the right of way. This work is now in progress and the novel manner in which the elevation is being accomplished is of interest. No interruption of the elevated railroad traffic or of the surface traction lines immediately underneath or of the ordinary street traffic has been made necessary or will be. The accompanying sketch illustrates the manner in which the problem has been undertaken.

The track elevation affects about one half mile of track of the elevated road in which length a maximum rise of 5 feet 11⅛ inches will be required. From this high point, a grade in both directions will be obtained by raising each of the present supporting columns of the elevated structure the required amount. The only provision required for protecting the track structure during the process has been the insertion of the latticed knee braces shown and the removal of the expansion bolts. To raise the supporting columns, the triangular set of timbers was placed as shown in the sketch and blocked up from the street. By means of jack screws and shims, the weight of the structure was taken off the column and by the same method the required elevation of the column was obtained. The old concrete piers were blasted out and new ones put in to a depth of 10 feet. New column feet of built up steel section as shown in the sketch, and of a height suited to the new elevation of each column were placed under the old columns after blasting out

FIG. 1—THE NEW NORTHWESTERN TERMINAL AT CHICAGO.

the former piers, and the old columns mounted directly on the new feet and riveted in place. Heavier anchor bolts were set in the new concrete piers in accordance with the increased unit stress on the column in which connection the knee braces mentioned above also add stiffness to the structure. Geo. W. Jackson, Inc., is the contractor.

The contracts for the remainder of the steel work will be let, there is reason to believe, in the next 60 or 90 days. Many novel engineering features will be involved in the work and the drawings for the entire structure are about complete. E. C. Carter, chief engineer of the Chicago & Northwestern road, has had supervision over the entire engineering problem with the assistance of W. C. Armstrong, terminal engineer. Frost & Granger, Chicago, are the architects for the terminal depot.

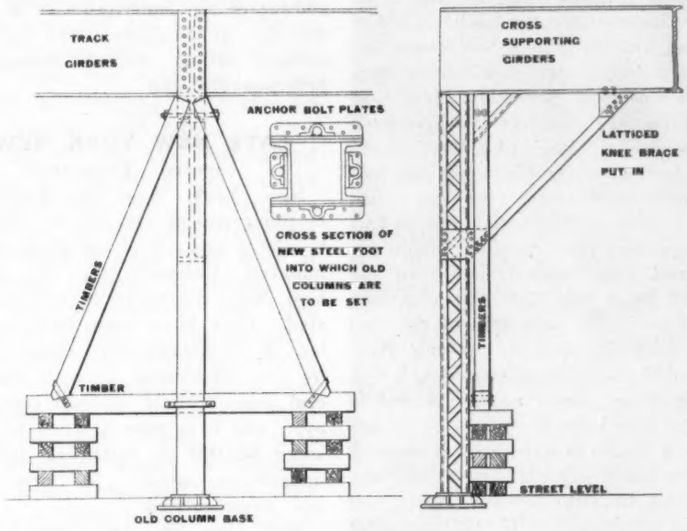


FIG. 2—METHOD OF RAISING THE OAK PARK ELEVATED TRACKS.

STEADY INCREASE.

(Continued from first page.)

been, it is true, pretty large exports at times of southern pig iron, and there have been heavy exports of rails for a long time. These were largely emergency exports, on account of a surplus at home. In the calendar year 1904, which was an "off" year in the domestic market, assiduous efforts were made to cultivate an export trade. Naturally the heaviest exports were made in the cruder materials, billets and sheet bars constituting a particularly heavy line. Gradually a trade was built up in the more finished forms, and this trade has been retained right through the period of most active demand from the domestic market. The average degree of finish of the exports has steadily advanced.

Besides the iron and steel products of which the tonnage is returned, as shown in the tonnage tables here presented, there is a large export trade in builders' hardware, cutlery, and machinery. These are returned by values only. The grand total value, including these lines as well as the tonnage lines, has been as follows in the past six fiscal years:

1903	$ 96,642,467
1904	111,948,586
1905	134,727,921
1906	160,984,985
1907	181,530,871
1908	183,982,182

In point of value, therefore, the fiscal year just ended has broken all the records, although the tonnage lines did not show up as well, in point of weight, as in the two preceding years.

Hardware and Machinery.

Outside of tonnage lines, the individual lines exceeding in value $1,000,000, have been as follows in the past two fiscal years:

	1907.	1908.
Builders' hardware	$15,014,703	$15,280,328
Firearms	2,769,917	2,669,489
Cash registers	2,488,324	2,341,719
Electrical machinery	9,005,766	8,495,219
Metal working machinery	9,369,056	8,696,235
Mining machinery	5,890,788	5,097,525
Printing presses	2,080,837	1,688,817
Pumping machinery	3,896,681	3,334,113
Sewing machines	8,092,518	7,734,139
Shoe machinery	1,299,166	1,199,086
Locomotives	9,093,111	8,626,574
Stationary engines	2,190,557	2,959,869
Boilers	3,054,633	2,942,339
Typewriters	6,274,439	6,495,756
Wood working machinery	1,197,663	1,310,027
Stoves and ranges	1,342,617	1,258,598

Valuations Higher.

The question will naturally be asked how it is that the total value of all iron and steel exports shows an increase, when the tonnage lines show a decrease in point of tonnage, and practically all the items enumerated above show slight decreases. Without going exhaustively into the data, it may be said that the valuations of the tonnage items are frequently higher for the fiscal year 1908 than for 1907, while there has been a marked progress towards a higher degree of finish. While scrap, pig iron, crude steel, wire rods and rails show decreased tonnages, structural iron and steel, tin plates, hoops and bands and pipes and fittings show a large increase, and thus, even without change in the unit value, the total value increases, though the total tonnage goes down. Pipes and fittings roll up a large value, amounting in the fiscal year 1907 to $8,331,267 and in the fiscal year 1908 to $11,273,289, a gain of nearly $3,000,000.

Decline in Imports.

The decline of more than one-half in our imports in the fiscal year just ended, is due chiefly to the practical cessation of pig iron imports. Ferromanganese and spiegeleisen are classed as pig iron in the returns, and probably constitute the great bulk of the tonnage reported since last September. From September to October, 1907, the so-called pig iron imports dropped from 29,030 tons to 9,893 tons. In the early part of the fiscal year 1908, these pig iron imports, due wholly to the temporary scarcity in our domestic market, were still large. While the total imports of all iron and steel in the fiscal year amounted to 354,575 tons, the imports during the first six months of this calendar year were only 110,020 tons, or at the rate of 18,337 tons monthly. June, with 21,106 tons, slightly exceeded this average.

Iron and Steel Imports, Gross Tons.

	June		Twelve months ending June.	
	1907.	1908.	1907.	1908.
Scrap	3,714	537	21,439	17,614
Pig iron	44,885	9,341	564,846	204,092
Billets, bars and steel n. e. s.	903	1,099	18,520	16,499
Wire rods	1,603	1,110	17,907	13,571
Rails	663	206	4,610	2,839
Structural	230	61	9,326	1,530
Bar iron	4,322	859	38,600	32,504
Sheets and plates.	241	241	3,429	2,623
Tin plates	3,880	7,650	63,629	62,830
Hoop, band and scroll	5	2	4,369	473
Totals	60,446	21,106	746,675	354,575

Iron and Steel Exports, Gross Tons.

	June		Twelve months ending June.	
	1907.	1908.	1907.	1908.
Scrap	1,945	1,991	22,152	20,518
Pig iron	5,977	4,906	85,000	52,518
Billets, sheet bars, etc.	3,750	5,583	113,866	92,893
Wire rods	677	462	10,250	6,534
Rails	18,358	15,759	291,322	278,867
Structural iron and steel	11,495	8,417	125,132	134,299
Bar iron	1,505	622	41,484	13,065
Steel bars	7,768	3,022	52,300	63,128
Iron sheets and plates	2,462	3,124	29,620	42,044
Steel sheets and plates	7,517	3,881	98,196	60,507
Tin plates	661	113	8,881	15,010
Hoop, band and scroll	419	274	5,886	8,560
Wire	11,727	10,416	161,241	156,960
Wire nails and spikes	3,601	1,234	39,953	35,541
Cut nails and spikes	664	528	7,871	6,481
All other, including tacks.	1,582	491	7,512	5,774
Pipes and fittings	12,888	8,956	128,579	168,591
Totals	92,996	69,779	1,229,245	1,161,270

OBITUARIES.

Henry C. Leonard, one of the oldest foundrymen in Taunton, Mass., died July 31, aged 81 years.

Henry E. Holmes, aged 55 years, head bookkeeper for the Colonial Steel Co., Colonia, Pa., for the past five years, died at Rochester, Pa., Aug. 1.

Henry R. Felker, one of the organizers of the Toledo Metal Wheel Co. and vice president of the company, died July 28 at Cary, O., aged 52 years.

Edward H. Llewellyn, secretary of the Chicago Malleable Iron Co., who was taken seriously ill in Germany, was hurriedly removed to his home in Chicago, arriving Aug. 8. It is feared that his ultimate recovery is doubtful.

George E. Day, president of the Day-Ward Co., Warren, O., died Aug. 10, at Saranac Lake, N. Y., after a long illness. Twelve years ago, he organized the foundry and machine company of which he was the head at the time of his death.

Frederick W. Sack, vice president of the Bassett-Presley Co., iron and steel jobber, Cleveland, died Aug. 10, at his home in that city, aged 36 years. Sarcoma was the cause of death. Mr. Sack had been connected with the company for 22 years, having worked his way up from a humble position to one of much responsibility.

George W. Harris, one of the early pioneers of Shiawassee county, Mich., died July 21, aged 80 years. At an early date he went to Corunna, Mich., from his home at Rochester, N. Y., and first engaged in the mercantile business for a number of years. He erected a furnace, one of the pioneer stacks of Michigan, and for a number of years manufactured plows and other implements.

George F. Larimer, aged 73 years, died recently at his home on the North Side, Pittsburg. He built the first Westinghouse air brake pump for an engine on the Pennsylvania railroad. He had been in the employ of the Westinghouse Air Brake Co. for many years, had charge of the company's exhibit at the Centennial in Philadelphia, and was afterward one of the foremen of the works.

Charles Gordon Zug, vice president and general manager of the Zug Iron & Steel Co., Pittsburg, and one of the best known young business men of that city, died at his summer home at Flushing, Long Island, Aug. 10. He had been in ill health for several months. Mr. Zug was 36 years of age and the son of Charles H. Zug, president of the company. He was educated in the public schools and the Western University of Pennsylvania and became identified with the Zug Iron & Steel Co. immediately after being graduated therefrom.

Charles Howard Blanchard, a pioneer stove and range manufacturer of the United States, formerly of Cincinnati, died at his home in Webster Groves, a suburb of St. Louis, Aug. 8, aged 67 years. He was born in Baltimore, and received his early education in St. Louis. At the breaking out of the Civil War, while engaged in business with his father, he enlisted in the United States Reserve Corps. In 1864 he removed from Washington, D. C., to Cincinnati and became interested in business with the Van & Son Range Co., and later had charge of a branch office of the concern in St. Louis. He bought the interest of the partners and conducted the business as Blanchard & Garrison. In 1880 he returned to Cincinnati and was elected president of the John Van Range Co. He went to St. Louis again in 1901 and remained there until his death.

Samuel Ellis Moore, auditor of the Pressed Steel Car Co., Pittsburg, and prominent in the early days of the Carnegie Steel Co., died at Pittsburg, Aug. 10, aged 58 years. He was particularly well known as an expert accountant and is credited with being the author of the accounting system now extensively used by the iron and steel manufacturers of Pittsburg and its vicinity. Mr. Moore was born in Pittsburg, Jan. 17, 1850, and after receiving a public school education entered the freight department of the Pennsylvania railroad, as a clerk under D. A. Stewart. Later he was employed by James Wood & Co., iron manufacturers, in which capacity he developed his accounting system. Finally with Mr. Stewart, he became associated with the Carnegie Bros. Co., as a clerk in the auditing department and in a comparatively few years, was made auditor, later becoming a partner. He remained with the Carnegie Bros. Co. until the formation of the Carnegie Steel Co. He was active in numerous business enterprises and in 1902 attached himself to the Pressed Steel Car Co. as auditor, a post he held to the time of his death. Mr. Moore during his life was very active in the furtherance of the temperance cause.

PERSONALS.

W. H. Griffin has resigned the position of sales agent for the Velox Mfg. Co., of New York City.

W. P. Pressinger and Charles A. Schieren Jr. have been elected secretary and treasurer, respectively, of the Machinery Club of New York.

R. E. Masters, formerly with the Marshall Car Wheel & Foundry Co., Marshall, Tex., has been appointed manager of the Houston Car Wheel & Machine Co., Houston, Tex.

Arthur A. Fowler, New York, resident partner of Rogers, Brown & Co., left Tuesday for Seattle, whence he will sail for a month's hunting trip in the Yukon district of Alaska. He was accompanied by his brother.

F. P. Van Horne, for some time secretary to President Hoffstot of the Pressed Steel Car Co., has been made assistant treasurer of that company and has been succeeded by J. H. King as secretary.

G. O. Scanland, assistant general auditor of the American Car & Foundry Co. at St. Louis, has been appointed acting district manager at Jeffersonville, Ind.

LATE NEW YORK NEWS.

(Special Telegram.)

New York, Aug. 12.—Reports in morning papers relative to the erection of a great steel car plant at Wilmington, Delaware, by the Bethlehem Steel Corporation are exaggerated. Cars have been built at Harlan & Hollingsworth works, owned by the Bethlehem concern for several years, chiefly wooden cars, however, and it is now planned to spend some $25,000 in equipping for steel underframe work. No new shops are contemplated.

First Vice President Gayley, of the United States Steel Corporation, returned from abroad Tuesday. Second Vice President Dickson is on vacation for August. Judge Gary is not expected until the middle of September.

CAR SHORTAGE FEARED.

(Special Telegram).

Chicago, Aug. 11.—The Illinois Manufacturers' Association is about to take definite steps with a view to impressing upon the railroads the imminence of a car shortage this fall. It is estimated that there will be a service on Jan. 1 1909, of 100,000 less freight cars than on the same date last year and it is the claim of the manufacturers that this is the result of the railroads' neglect in repairing equipment during the panic. The opinion is also held that the railroads have been willing to permit something of a car shortage to arise in order to make more urgent in the eyes of shippers the necessity of increasing railroad revenues to meet expenses. The railroads declare, however, that much repair work has been and is being done and in the west the Rock Island, Burlington and New York Central lines report that their repair shops are working almost up to capacity.

J. C. MABEN*

J. C. Maben, president of the Sloss-Sheffield Steel & Iron Co., is 66 years of age, very active in the business world, regular in his daily habits, always alert at his office, and a man who has great faculty for looking ahead. He was born in Petersburg, Va., but while a very young boy his parents moved to Richmond, where he resided until the breaking out of the war. He joined the Confederate army, being assigned to the Twelfth Virginia regiment. He was in the ranks but two years when he was commissioned and sent to Longstreet's headquarters, where he remained until the surrender. After the war, he returned to Richmond and in October, 1868, moved to New York. In 1887 he was instrumental in buying the old Sloss Iron Co. and formed the Sloss Iron & Steel Co. He was on the executive committee of that company until 1900, when it was deemed advisable to extend the bounds of the company, and three furnaces at Sheffield, brown ore fields at Russellville and coal properties in Walker county, Alabama, were purchased and the Sloss-Sheffield Steel & Iron Co. was formed. He was elected president, moved to Birmingham in May, 1902, and since that time has maintained his residence in this section.

The Sloss-Sheffield Steel & Iron Co. has seven furnaces, four of which are kept almost constantly in operation. The company has a number of coal mines, washers, ore mines, both red and brown ores, ore washers, coke ovens, limestone and dolomite beds with crushers for the same, and other properties. The company has a splendid surplus and is in sound condition. Mr. Maben is an ardent member of the American Iron and Steel Institute.

President Maben's Report.

In his annual report, delayed somewhat by his recent sojourn in Europe, President Maben places the company's iron ore lands at 51,125 acres, of which 2,060 acres of hard ore properties and 1,924 acres of brown ore lands have been worked. Mr. Maben believes that a conservative estimate of the brown ore owned by the company is 133,500,000 tons, and it is believed that there is a total of 492,400,000 tons of hard ore, making the aggregate ore properties of the Sloss-Sheffield company 625,900,000 tons. The aggregate amount of coal in the several divisions is 1,435,090,348 tons, according to the estimate of an expert. In spite of the adverse conditions in all the departments of the iron trade, the net earnings of the company for the last fiscal year were sufficient to pay fixed charges, the full 7 per cent on the preferred and 5 per cent on the common stocks, and still leave a surplus of $510,663.

Referring to the results for the fiscal year ended Nov. 30 last, Mr. Maben says that the company began with the promise of the most successful year from the standpoint of earnings since its organization. Iron was in good demand at high prices; the shipments of coal were limited only by the ability of the railroads to furnish cars. Early in the year, however, a shortage of cars developed, and then the effects of the distrust engendered by the financial panic began to be felt to some extent. But the greatest loss in earnings followed the slump in October, after which the delivery of iron which had been sold at a good profit, was not over 50 per cent of normal, the buyers being unable to receive and pay for the iron for which they had contracted. Earnings were reduced considerably below the figures the management had reason to expect.

J. C. MABEN,
Director of American Iron and Steel Institute.

*Ninth of a series of brief biographical sketches of officers and directors of the American Iron and Steel Institute. The others of the series have been: Elbert H. Gary, April 16; Willis L. King, April 23; John A. Topping, May 7; Wm. A. Rogers, May 14; E. A. S. Clarke, May 21; Thos. J. Drummond, June 4; Samuel Mather, July 9; and Chas. M. Schwab, Aug. 6.

LAST SHIPMENT

MADE FROM ONE OF THE OLDEST MINNESOTA MINES.

Steel Shaft in Use—Trouble With Water at the Syracuse—Activity on the Western Part of the Menominee Range.

One of the interesting chapters in the history of Minnesota iron mines closes with the shipment of the last carload of ore from the Chandler mine on the Vermillion range. It has been known in a general way for some time that the end of mining in the Chandler deposit was approaching and it is now understood that last winter saw a practical ending of hoisting in the shaft. A stockpile of something less than 200,000 tons had been accumulated and on July 31 the last of this was sent down. The Chandler mine was the second Minnesota mine to ship ore. The first ore was sent down in 1887 and since that time, exclusive of the ore mined last winter, 9,096,639 tons have been shipped. The deposit was discovered by James Sheridan, is located on land owned by Martin and W. H. Pattison, of Duluth, was opened up by Capt. Joseph Sellwood, the operating lease was acquired by the Minnesota Iron Co. and later by the Oliver Iron Mining Co. The ore from the Chandler, like that from the Pioneer which adjoins it, is noted for its quality, being a high grade Bessemer of good physical structure and analyzing approximately as follows: Iron, 63.20; phosphorus, 0.0427, silica, 5.59; moisture, 5.40.

Hoisted Through a Steel Shaft.

Attention is attracted to the development of the Chapin group of mines of the Oliver Iron Mining Co. at Iron Mountain by the hoisting of the first ore through the new "C" Ludington shaft a fortnight since. The sinking of this shaft, which was begun May 6, 1903, indicates something of the mine's future in that it is expected that the greater part of the ore taken from the group for many years to come will be hoisted out through this shaft. The Chapin ore deposit deepens and grows larger in the direction of the old Ludington mine and this new shaft, which is down to a depth of 1,522 feet, represents the development of the mine in this direction. The shaft is the first to be built of steel on the Menominee range, is surmounted by a steel shafthouse, a view of which is shown in the issue of Oct. 17, 1907, of THE IRON TRADE REVIEW, and is practically fireproof. It has four compartments, two for hoisting, a cageway and a compartment for the pump. The inside dimensions of the shaft are 10 feet 4 inches by 23 feet 1 inch. The shaft equipment is unique in the installation of the large Cornish pump which was formerly at the Chapin "D" shaft. This is of the walking beam type, with a long pump rod in the shaft, the pump being designed for a capacity of 3,000 gallons per minute against a head of 1,500 feet. The shaft is now connected with the Chapin workings at the 10th and 14th levels and is intended for an ultimate depth of 3,000 feet.

The struggle with water difficulties, which for so long a time has almost completely prevented the making of any headway in opening the Syracuse mine near Biwabik on the Mesabi range, finds its latest development in a plan to sink another shaft to be used as a drainage shaft for the one which the Foundation Co. succeeded in putting down to ledge. In this concrete shaft it is understood that pumps to a capacity of 7,000 gallons have been installed. Between the choking up of the shaft with water and steam pipes and the ingress of water, the shaft was being sunk only a few feet a month. With a separate shaft for handling the water, it seems probable that very good progress can be made.

More Exploratory Work.

The west end of the Menominee range, including the Iron River, Stambaugh Valley, Crystal Falls districts and the neighboring lands, has been in the past years the scene of unusual exploratory activity. The slump of the last nine months in the ore trade reduced operations to a minimum, some work being completely abandoned. Operations are now being increased in many directions, as regards both mining and exploring. Corrigan-McKinney & Co., are reported as taking leases in section 29, 48-34, in the Iron River district, properties known as the Blair and Michaels, both of which have been drilled before. The Verona Mining Co. (Pickands, Mather & Co.) is to continue with the work on the Swanson and Young's forties in the Stambaugh Valley and the Bucholtz and McColman properties in the Iron River district. Options have also been taken on new properties in Bates township. Work is going on actively at Red Rock. The work at the old Gibson mine by the Rogers-Brown Ore Co. is being continued steadily and samples taken from the explorations indicate very satisfactory progress. Shipping from the active mines of these districts increases slowly. The Hemlock is shipping all-rail, the Baltic is shipping from stock pile, as is the Bristol. At Crystal Falls, shipping from the stock piles of the Corrigan-McKinney group has been stopped and the only mines which are operating to any extent are the Tobin, Great Western and Dunn. The second shaft of the Groveland mine of the Huron Iron Mining Co. has been completed and ore is being shipped from it.

More Active Operations.

On the Mesabi range, the increase in shipments indicates the gradual increase of mining operations. At the Hull-Rust, five shovels are in ore and at the Burt, three. Shipments from Mountain Iron are still comparatively small, but work has been started with shovels in the Morris and Hartley pits. Shipments were recently begun from the stockpiles at the Shenango Tener and Hull mines. Corrigan, McKinney & Co., Stevenson, Jordan and Commodore mines are shipping moderately. The Republic Iron & Steel Co. is shipping from its Franklin group. Its Alexandra mine was worked out last year, but this company also has under lease the Braya, nearby, which may be opened up the latter part of the year preparatory to shipping next year. The Meadow mine at the east end of the range now has a shaft down and the first ore has been hoisted. The sinking of a shaft on this property has been attended with considerable trouble caused by sand. Shipping has also been begun at the Adriatic mine.

The large deposit containing several million tons of Bessemer ore in section 11, 57-21, near Hibbing, controlled by Coates & Miller, was leased to Tod, Stambaugh & Co., recently. It will be an underground mine and will be developed, beginning at once. This deposit, with the possible exception of the one being drilled on the shore of Embarrass lake, was the largest Bessemer deposit remaining on the Bessemer range, not already under control of interests consuming the ore.

A petition has been filed in court asking for a receiver for the Bellevue Pipe & Foundry Co., a concern that was moved from Detroit to Bellevue, O., about one year ago. The citizens of Bellevue subscribed $85,000 to secure the factory. The entire capital stock of the concern was $120,000.

THE MANUFACTURE OF EMERY WHEELS.

The Pittsburg Emery Wheel Co., Pittsburg, has recently completed and put in operation at Rochester, Pa., a plant for the manufacture of emery and corundum wheels, with a capacity of wheels up to 36 inches diameter. Although the making of a completed wheel requires about three weeks from start to finish, the process is a comparatively simple one and the machinery required is not extensive.

The raw material for the wheels comprises emery, corundum or adamite mixed with a clay binder. The emery in its raw form contains considerable iron and in use may shrink unless it is burnt. Accordingly both the emery and the binder are burnt in a kiln which is built in the form of a muffle furnace. The clay is thoroughly dried and the emery or corundum burnt in a temperature of about Seger cone 10. This burning removes from the emery all tendency to further shrinkage and it can then be put in the wheels without danger of their cracking or becoming imperfect in use.

After this preliminary burning, the first process in the making of the completed wheel is molding. The clay binder and the emery, corundum or adamite, as the case may be, are mixed with water in kettle shaped vats to a consistency of thick mud. The proportions of emery and clay are varied as are the grades of emery used to suit the conditions under which the wheel is to operate. A soft wheel in general possesses a relatively greater amount of binder than a hard wheel. After mixing, the wheels are molded on plaster of paris "bats." These consist of circular plates of plaster of paris properly baked and dried, and on which are mounted a galvanized iron ring of the diameter to which it is desired to mold the wheel. A sheet of paper is placed over the plaster of paris bat and inside of the metal ring to prevent the wheel from adhering when it is dry.

The next operation is air drying of the wheel. After it has been molded, the metal ring is removed and th- wheel allowed to stand on the b- til it has attained a certain It is then removed to t' of the kiln room w- ture is rather stand for - hard - ir

- un- - firmness. -e upper floor -nere the tempera- nigh, and allowed to - few days until it is fairly -nd firm enough to be trued up - the shaving machine. This shaving machine bears a close resemblance to the ordinary potter's wheel and is shown in one of the accompanying illustrations. It comprises a vertical spindle carrying a revolving platen on which the wheel to be trimmed is placed. A pair of standards carry a cross rail extending across the platen, and on which trimming knives are carried. These are adjustable to any height, and by running them across the face of the wheel as it is revolving on the platen, the form is cut

FIG. 1—SHAVING MACHINE FOR TURNING EMERY WHEELS ROUGHLY TO SHAPE.

down to any thickness desired. It is also trimmed roughly to the proper diameter by feeding the knives down vertically on the edge of the wheel.

This shaving machine is also used in forming odd-shaped wheels, as cup wheels, for instance. A cup wheel is molded in cylindrical form to the total thickness which the outside of the cylinder will have. The interior portion of the wheel is removed by means of the shaving machine, which is the only machine used in shaping the wheels. The material removed from the wheels by this machine is carefully collected and placed in barrels labeled with the grade and mixture, and this material is used in molding up other wheels of the same constituency.

After shaving, the wheels are transferred to the kilns for their final burning. The kilns are four in number, 20 feet in diameter, and strongly banded with iron bands. They are coal fired, and each kiln is provided with seven fireplaces. The wheels are placed in the kilns in piles separated from one another by tall plaster of paris bats, and after bricking up the entrance the kiln is lighted. The passage of the gases from the fire at first is into the kiln chamber, up through the wheels and out a damper at the top. As the burning proceeds, this damper is gradually closed until at the end the passage for the gases is into the chamber at the top, then through holes in the floor, through passages under the floor and up through an annular space in the kiln wall. When this stage of the burning is reached, the kiln is at a white heat. The burning proceeds for three or four days, and then the fires are drawn and the wheels allowed to cool, which process takes about three days.

The final operation in the manufacture of the wheels is the trimming to exact sizes. This is done in four trimming lathes, three of which are operated on the side of the wheel and the third one on the face. The lathes are strongly built machines with both cross and longitudinal feeds to the carriage, which is provided with a compound rest to allow wheels to be trimmed to any angle. For instance some wheels are thinner at the circumference than at the hub, and others thicker at the circumference. These latter wheels are used in universal grinders and are made in this manner in order to provide clearance when working in slots or similar situations. One of these machines is shown in the accompanying illustration. After truing, a lead center is poured in the hole in the wheel and bored to the proper diameter to fit on the arbor, and then the wheels are tested for bursting strength.

FIG. 2—KILNS FOR BURNING THE WHEELS.

This testing is done in a machine shown in the illustration, Fig. 5. It comprises simply a pair of arbors running in strong steel casings provided with doors. The arbors are provided with flanges and nuts on which the emery wheels may be mounted, and after the doors are closed the wheels are speeded up until they attain a rim velocity of about 1½ miles per minute. They are subjected to this speed for about five minutes and in that time any defects in their construction will become apparent, and if the

wheel bursts the pieces are confined within the steel casing without injury to anyone. Varying speeds are necessary for varying diameters, and these are obtained by means of a pair of Evans friction cones and suitable cone pulleys on the countershafts.

Steel flanges are used to confine the wheel, these being made in a machine shop adjoining. The flanges are clamped on either side of the wheel, and are steel castings. As the wheel wears down the flanges are removed and smaller ones substituted until the wheel becomes too small for any further use. The use of flanges extending almost to the rim of the wheel tends to strengthen it and prevent undue strains leading to bursting.

FIG. 3—MUFFLE FURNACE FOR BURNING THE RAW EMERY.

As the emery worn from the wheels has a deleterious effect on the machinery if allowed to accumulate and work into the bearings, provision has been made for its removal by means of exhaust fans. These are piped directly to the machines and exhaust outdoors, so that the air in the shop is remarkably pure.

The Pittsburg Emery Wheel Co. was organized in December, 1907, and its officers are: Chas. G. Smith, president; David B. Hyde, vice president; J. Walter Hetzel, secretary, and Albert W. Smith, treasurer.

THE ACCURACY OF COAL ANALYSES.

In view of the growing favor which the plan of buying coal on a basis of heating value and analysis is meeting, the chapter on the accuracy of coal analyses in the recently issued volume entitled, "Coals of South Wales," by W. Pollard, is of special interest. Mr. Pollard points out that in the proximate analysis it is very important to work as much as possible under constant conditions. If the strength of flame, time of heating, size of crucible, etc., be altered, the results will almost invariably differ, and, unless these details are looked after, will be unreliable.

From experiments it has been found that an increase of water gives an increase in the volatile matter. The presence of carbonates in the coal also affects the results. In a coal which contained 12 per cent carbonate of lime and magnesia, recently analyzed, the amount of carbonic acid left in the coke after the estimation of volatile matter was only 0.9 per cent, hence 11.1 per cent had gone off as volatile matter. The resulting ash was too low. Further, it is not possible to say to what extent the reaction $CO_2 + C = 2CO$ goes on, but this must have a considerable effect on the result.

The ultimate analysis is quite as susceptible to error as the proximate determination. In this analysis the way in which the moisture is estimated may affect the percentage of practically all the constituents when expressed in percentage of pure coal. In one example the difference between moisture obtained by drying in the toluene bath and over sulphuric acid in *vacuo* for 24 hours was 0.3 per cent.

In estimating ash, the value for the ash left in the combustion tube is almost invariably higher than that obtained by ashing in the muffle. The reason is that in the combustion tube, where the coal is burned in oxygen, more of the sulphur is converted to sulphuric anhydride, which combines with any lime in the ash, while in the muffle the atmosphere is less highly oxidizing, and more of the sulphur goes off as a lower oxide, instead of combining with the lime in the ash. Should minerals containing ferrous compounds be contained in the coal, these will, on burning the coal in oxygen, become ferric. Hence the ash, as found by analysis, will be greater than the original ash in the coal, and the oxygen will be too low.

When coal containing pyrites is burned in oxygen, the pyrites is converted into ferric oxide and oxides of sulphur, and in the final weighing the oxygen, which is obtained by difference, will be too low.

Carbonates in a coal are more or less decomposed during analysis, giving off carbonic acid gas. This is absorbed by the potash bulbs, and is weighed with the carbonic acid formed by the combustion of the carbon in the coal. The result is that the carbon is too high, the true ash too low, and the oxygen too high. Corrections, however, can be made for this by running a special analysis to obtain the CO_2 in the ash.

Where both carbonates and pyrites are present, there will naturally be complications, as the oxides of sulphur will combine with the lime or magnesia of the carbonates, thus lowering the combustible sulphur and increasing the sulphur-in-ash. It is not possible to correct this.

A shop building for use by the College of Engineers in connection with the Iowa State University work, Iowa City, Ia., has been decided upon. The proposed building will be a large one and will be equipped with the machinery from the old shops, as well as a large amount of new machinery purchased.

ACCOUNTING FOR LABOR AND MATERIAL.[1]

By Oscar E. Perrigo.

Labor is defined as toil or exertion, physical or mental, especially when fatiguing, irksome or unavoidable, and that which requires hard work for its accomplishment. This definition divides labor into two general classes, physical and mental. In manufacturing operations we have to deal with both. Hence we have the engineering force, the operating force, and the accounting force.

To carry on the manufacture of any product, however simple, the first requisite is labor, whether it be of the engineer who plans or of the mechanic who does the manual work. Capital is also essential, but capital does not perform the work; it is rather the means by which others are induced to perform it, while the laborer, acting for himself, may by his labor produce that which he may sell, provided he possesses the other essential, material. The opportunity to labor is furnished by the possession of material upon which to work. To possess this material we must again have labor, as of the miner who digs the ore. So that whichever way we turn the indispensability of labor is at once, and at all times apparent.

Thus labor and material are the two absolute essentials to manufacturing. The manner of obtaining them is quite another question.

If labor and material are the first essentials to carry out plans for manufacturing, we must have the proper class of labor and the proper kind of materials for prosecuting the work. Having obtained these we must of necessity have a proper system of supervision for the labor and proper methods for handling the materials.

And not only must the supervising system be of the best, and the methods of handling material of the most approved form, but we must have accurate and comprehensive systems of recording and accounting for the various circumstances and conditions, hours and rates, output and efficiency of labor, and the kind, quality, price and quantities of the different classes of material that we find it necessary to use.

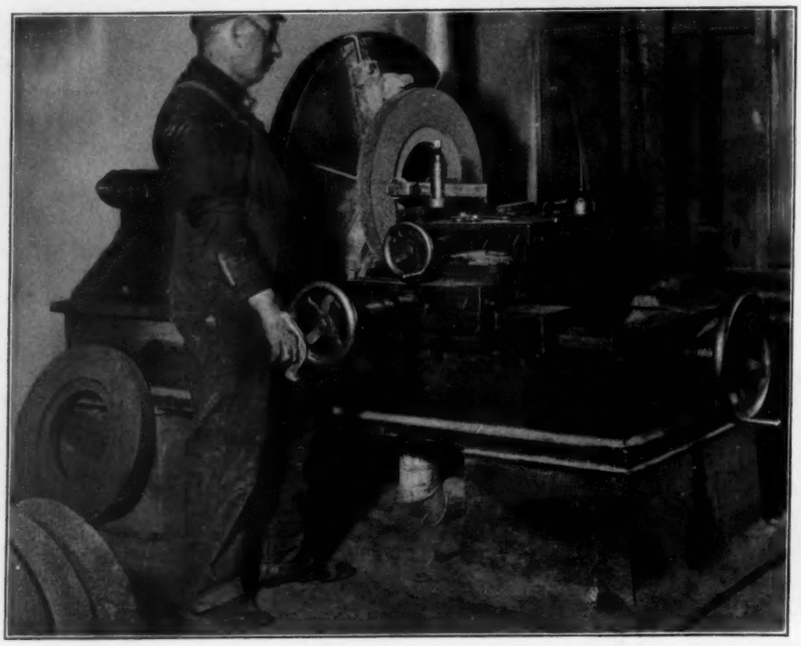


Fig. 4—Lathe for Finishing Emery Wheels.

In a previous article entitled "Recording and Accounting for Time," various systems were discussed and numerous forms of time cards were shown. These cards were designed by men well trained in the business and represented ideas, both from different parts of this country and from England. There remains, however, something to be said on the subject of what is frequently termed "productive" and "non-productive" labor. The question as to which of these accounts a certain item of labor shall be charged has caused much discussion and there are many honest differences of opinion in regard to it.

The questions at issue are not questions of fact, since all labor, whether mental or physical, whether administrative or clerical, and whether physical labor is applied directly upon the output, or in repairing the building in which the work is done, must finally be borne by the output and become a part of its cost. The questions are rather those of method in the system of accounting by which the most valuable information may be gained during the process of manufacture.

Accounting is not only a means of arriving at and exhibiting a final result which gives valuable records of the business transactions which it covers, but in the modern conception from time to time during the progress of the work, which shall enable one to judge of the state of the business in detail, the success of the methods in use for administrative, clerical and mechanical purposes, or the deficiencies in these methods, which will point to or suggest the ways and means for their improvement, until success shall be achieved by a close and frequent comparison of results. Considered in this light, accounting takes on a much more comprehensive scope than formerly, and becomes one of the studies which should be of interest to the engineer, rather than left entirely to the bookkeeper who is liable to view the matter entirely from a clerical conception.

In discussing the question of productive and non-productive labor, we may say in general terms that productive labor is all labor, by hand or machine, which is performed upon the material entering into the product and that non-productive labor is all other labor, material or physical, performed in and about the plant. This is, of course, assuming that the business is entirely manufacturing, and does not include the selling of the product, since the selling is no part of the manufacturing cost and the expense for labor in that department is not included.

The fact that labor of certain kinds is considered as non-productive does not exclude its cost from the accounts whose purpose is to give information as to the total cost of the product, but rather a term by which different classes of labor are distinguished in accounting operations. That which is commonly called non-productive labor is just as necessary to turning out the product as that called productive labor.

Usually men occupying certain positions are habitually classed on the productive labor accounts, and certain others on the non-productive labor accounts. But this is not always the case, since some of this labor, whether mental or physical, may sometimes be charged as direct labor and applied to the factory cost of the product;

[1]Eleventh of a series of articles on Shop Management and Cost Keeping.

and again, under slightly differing conditions, it may become non-productive labor and go into one of the direct labor classes.

It will assist to a better understanding of the question of labor classification if we assign the different kinds of labor to one or the other of the three classes of productive, non-productive, and a third class which may be assigned to either under certain circumstances. We will first arrange this classification as it will stand for a machine shop or manufacturing plant, having a general office and an engineering force. This classification will be substantially as follows:

Productive Labor.

Machinists, Operatives, Apprentices, Helpers, Blacksmiths, Forgemen, Hardeners, Annealers, Laborers — When working on machines, at the bench, at assembling, erecting, forging, hardening, or in helping those engaged upon any of these operations, or parts, or material constituting the product.

Non-Productive Labor — In Manufacturing Departments.

Factory manager	Electricians
Superintendent	Tool keepers
Assistant superintendents	Store keepers and their clerks, laborers, etc.
Foremen	Carpenters
Assistant foremen	Belt fixers
Gang bosses	Crane men
Time study men	Elevator men
Time clerk	Shop transportation men
Manager's and superintendent's clerks	Oilers
Stenographers	Sweepers
Engineers	Watchmen
Firemen	Errand boys
	Yard gang

GENERAL OFFICE.

The entire general office force.

STABLES.

Stablemen, Teamsters

Occupations That Are Sometimes Productive and Sometimes Non-Productive Labor.

Mechanical engineers, Draftsmen, Tool makers, Pattern makers, Pattern apprentices, Mill men, Laborers — When working directly on the product, or upon work which by contract or agreement is to be charged directly to a production order, their labor is productive. Otherwise it is non-productive.

An iron foundry may be run as one of the manufacturing departments, but there will be advantages in considering it as a separate plant, connected with the manufacturing portion of the plant only by way of the general office. The method which seems best adapted to handling the labor account in the foundry is to divide labor into three accounts of "Productive," "Non-Productive" and "Tonnage Expense Labor." By this plan the following classification will be made.

Productive Labor.

Molders, Helpers, Apprentices, Core makers, Helpers, Apprentices, Casting cleaners, Chippers, Laborers — Working in green sand, loam, and dry sand, and whether on floor work, bench work, or molding machine work, providing the resulting castings are to go into regular product to be sold and shipped, or used in the product of the manufacturing departments.

Tonnage Expense Labor.

Melters,
Cupola and ladle liners,
Charging men,
Sand and facing mixers,
Laborers on this class of work,
Yard men, handling charging metal,
Molders, helpers and apprentices when making shop castings,
Laborers, recovering foundry scrap.
Laborers, cleaning up shop, and removing refuse, dirt, etc.
Laborers, loading and unloading materials.

Non-Productive Labor.

Superintendent	Watchman
Clerks	Crane men
Foremen	Laborers
Electrician	Night men
Carpenters, Blacksmith — When not on work chargeable to a production order.	

If the iron foundry is a part of a manufacturing plant it must bear its proper share of the expense of the general office. A fair basis for thus assessing a portion of the General Office expense against the foundry will be the proportionate total number of men in the manufacturing department and in the foundry. If it is an entirely separate plant it must have a commercial office of its own, through which to transact business with its customers.

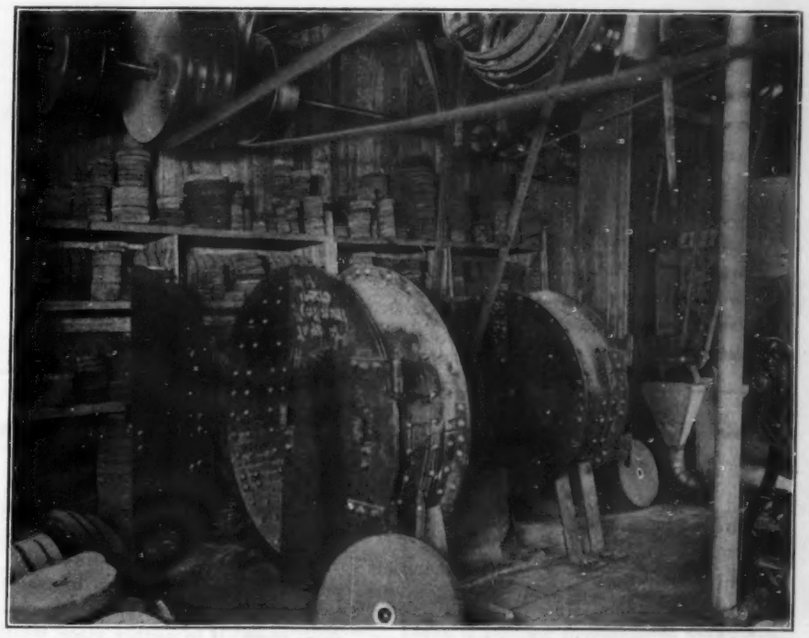


FIG. 5—MACHINE FOR TESTING EMERY WHEELS FOR BURSTING STRENGTH.

It will, of course, be understood that the above classification relates only to the general classes of labor, distinguishing between that which is usually considered productive and that which is not. In the case of the foundry the class denominated tonnage expenses is productive labor. This special class is arranged for the foundry, so as to give more detailed and perfected information in the matters and conditions peculiar to the foundry and its operations.

For the purposes of the accountants in gathering these labor accounts into the proper general accounts of the company another classification of labor accounts, as used in several large establishments, will be necessary. It is as follows:

1. New construction work. Buildings, bridges, roads, etc.

2. Repairs and maintenance of real estate. Labor on land, fences, roads, buildings, etc.

3. Production. All labor applied directly to getting out the product.

4. Experimental work. Designing, building and testing new machines, while in the experimental state.

5. General expense, or overhead burden.

6. Selling expense, including advertising and similar publicity expenses.

7. Engineering and drawing when not properly chargeable to any of the above classes.

It will be understood that each of these general accounts are sub-divided into many different accounts, and as these will be determined by the nature of the business and the kinds and the classes of product turned out, it is manifestly impossible to indicate them here. For instance, a plant building electrical machinery and apparatus would have an entirely different list of accounts from one building engines, or another building machine tools.

The arrangement of these various accounts at the inauguration of a new business is an important matter and should be carefully considered by men trained to manufacturing accounting, otherwise there will be many changes and additions and some accounts will be thrown out altogether as the conditions manifest themselves more clearly and prominently in the actual experience of daily routine. Competent planning at the outset will eliminate most of these difficulties, and much unnecessary labor.

The details of securing a record of the time to be charged and the methods of handling these records has been fully con-

sidered in a previous article on recording and accounting for time, in which various styles of time cards and different methods of using them are given, as well as a brief statement of the recent advances in this department of accounting.

Secondary only in importance to the labor question is that of materials. Here, again, we meet with a large variety of articles that are to be classified and arranged according to their nature and uses and divided into numerous sub-classes for convenience of purchasing, handling, storing and issuing, as well as considering their ultimate destination in the plant.

The requirements of the successful handling of material, or in other words, store keeping, may be stated in general terms as,

1. To economically purchase materials of good quality and well adapted to the purpose for which they are to be used. 2. To store these materials safely, conveniently, and in an orderly and well classified manner. 3. To handle and issue these materials promptly and with an economical expenditure of time. 4. To accurately account for the receipt and issuance of all material, and to show at any moment the minimum and maximum amounts, and the amount actually on hand, of any article in the store room.

To answer the first requirement would ordinarily be considered as the work and responsibility of the purchasing agent. Primarily the responsibility does belong to this official, yet without the active co-operation of certain other officials he cannot satisfactorily and successfully perform his duties. The store keeper must keep him informed as to his stock on hand, and as to any complaints that may be made in reference to the stock issued to the manufacturing departments. The purchasing agent should keep in close touch with the superintendent and his assistants, and the foremen of the different departments, that he may have the advantage of their judgment as to the proper grades and dimensions of stock to purchase, as well as with the factory manager, or the general manager, as the case may be, to get his instructions and wishes as to the general direction of his work and the advisability of taking advantage of certain market conditions from time to time as they may occur.

The question of purchasing material at the proper time is of much importance. Experience teaches that the entire shop organization has been thrown out of effective working condition, contracts have failed and expensive, and not infrequently, disastrous litigation has ensued, on account of the non-arrival of material for carrying on the manufacturing work. It is, therefore, the duty of all operating officials to be well informed on the question of the supply of material for use in their respective jurisdictions, as to whether it is on hand in their departments or in the store room; if in neither place, whether it has been ordered, and the date it is expected to arrive. In this case they will make a note of the date, upon the order upon which the material is to be used. Repeated and persistent inquiries must be made of the purchasing department and the matter followed up until the material is on hand.

To aid in carrying out this plan the "Follow-up Material Card" shown in Fig 1 is used by the superintendent and his assistants, mechanical engineers, foremen, store keeper, and other interested officials. It is sent to the purchasing agent, who will enter the information asked and return the card to the official who signed it. It will serve to remind the purchasing department of the need of the material and give the manufacturing department some idea as to when it may be expected. If it is not received at that time the purchasing agent should be again notified. Should the need of the material be urgent and the expected arrival quite a distant date, it may be necessary to send in several of these cards at proper intervals.

It will be the duty of the store keeper to make such provisions and dispositions as will fulfill the second requirement in arranging the store room and planning the location of the different classes of articles so that they may be safely kept in good condition and within convenient reach when wanted. Articles frequently called for will be placed nearest the point of issue, and generally heavy articles will be placed near the floor and lighter articles on higher shelves, etc. Racks, sets of bins, shelves and other sets of receptacles will be so arranged as to obstruct as little as possible the free passage from any part of the store room to the point of issue. All raw material, manufactured or partly manufactured stock should be carefully classified and certain portions of the store room assigned to each class, or sub-class.

Bins, boxes, shelves, or other receptacles should be plainly marked showing the contents and the quantity they contain. For this purpose card holders of sheet or cast brass or iron, as may be most convenient, are provided as shown in Fig. 2, of two or more sizes, as may be necessary, holding cards 1½ x 3, and 2½ x 3½ inches, and of the form shown. The name of the article is written in large, plain letters at the top and its dimensions on the next line. Then follows the unit of count or weight as dozens, gross, pound, etc. The next line gives the minimum and maximum quantities, between which the stock should be maintained. The remaining portion of the card is ruled in vertical columns for the purpose of: Entering the amount of material of this kind received; subtracting from this amount the quantities issued from time to time. Thus the amount on hand is always shown on the card. These cards may be of different colors for different classes of material. This will be found a great convenience in quickly locating the different classes,

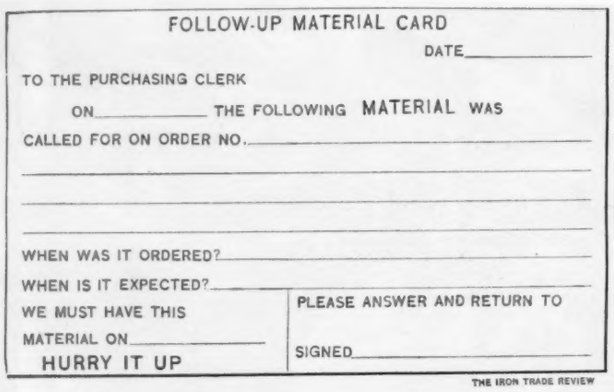


FIG. 1—FOLLOW UP CARD FOR MATERIAL ORDERED. SIZE, 3 x 5 INCHES. COLOR, LIGHT RED.

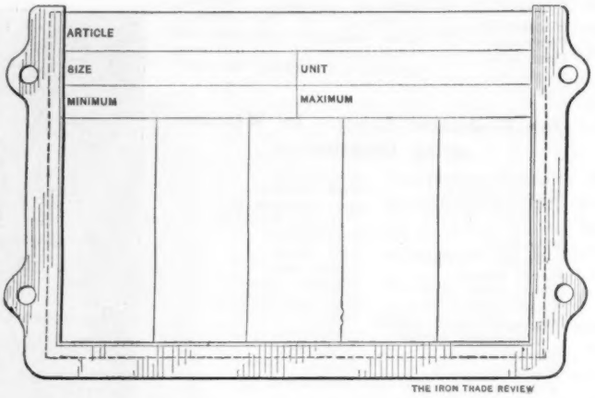


FIG. 2—CARD AND CARD HOLDER FOR SHELVES, BINS, ETC. SIZES, 1½ x 3 AND 2½ x 3½ INCHES.

particularly those from which issues are seldom made.

To provide for the third and fourth requirements, in the prompt, accurate and economical handling of materials and to account for their receipt and issue, the following methods are presented as those in successful use in many plants.

Every article of material will be accounted for on a stock ledger card. This card, like that in the card holder where the material is stored, gives the description of the article and the minimum and maximum quantities. The remaining space is devoted to (1) a record of material received, (2) a much greater portion to that issued, as the material is received in considerable quantities and at comparatively long intervals, while issues being made frequently and in small quantities, require much space in which to record them.

Material is entered on the card as soon as it is received, adding the amount to that on hand. As issues are made they are entered, giving the date and amount, the total being carried out on the horizontal line. They may at any time be added vertically and subtracted from the total amount received to show the balance on hand. When this card is filled up the amount on hand is ascertained and carried on to another card and future operations entered as before. The cards are printed upon both sides with the same form so as to increase the space for entries.

The importance of establishing minimum quantities for each article should be given careful attention. Various methods have been proposed for this purpose, but in many plants it is left to the store keeper, who, if he carefully observes the movement of his stock will soon arrive at the proper figures. It may be calculated by using the amounts issued through a period of three or six months, with reasonable accuracy.

By careful attention to this matter the store keeper may be able to save much unnecessary expense for stock and material kept an unusually long time on the shelves, and should changes occur which render the stock more or less obsolete there will be a smaller quantity to work off. Once every three or six months the amounts shown on the stock ledger cards should be checked by the quantities of stock actually found on hand so as to correct any errors that may have been made in keeping the routine accounts of receipts and issues. By this method a perpetual inventory is kept which is at all times and instantly available for the information of the store keeper, the purchaser, or any of the managing officials who desire to know any of the details relating to this department, where so many thousands of articles are stored and frequently costing many thousands of dollars.

Raw material, and such as is too heavy or too bulky to be kept in the store room proper will be stored in any available warehouse, storage shed, etc., and there represented by the cards shown in Fig. 1, and in the store keeper's office by stock ledger cards, the same as if it was actually in the store room. No person will be allowed to interfere with the store keeper's charge and control of it.

Material should be issued on a properly authorized requisition. These requisitions will be signed by the foreman of the department to which the material is to be sent. The foreman's authorization will usually be the possession of a regularly issued and numbered order for performing the work for which he calls for material. Should he call for material for any other purpose he will state the purpose, or, as in the case of such consumable supplies as oil, waste, etc., he will write "for general use." In some establishments one form of requisition is used for material for production orders, and another form, printed upon a different color of paper for consumable supplies. However, the form shown in Fig. 3, will be found quite sufficient for all purposes although it is a decided advantage to use two colors of paper and the words "to apply on order No." may be changed to "for general use," thus adapting it for a consumable supply requisition.

This requisition is printed upon a 3 x 5 inch card, and gives first a serial number from the department from which it emanates, the date, and the name of the department. Then follows the quantity, the sizes and a description of the articles desired. Below is a space for the order number and the signature of the foreman. When the store keeper issues the articles he requires the signature of the person to whom they are delivered, and then enters in the column headed "value" the cost of the articles issued and places the date in the lower left hand corner. After making the proper entries on his stock ledger card, he will send the requisition card to the cost clerk. Thus this card is not only a requisition, but a receipt, and when sent to the cost clerk it becomes also an invoice of goods issued to the manufacturing departments. The foremen have their requisition cards in blocks with sheets of paper, printed with the same form, between them, and by the use of a piece of carbon paper the card is made a carbon copy of the original on paper, which is held for reference in making up the material account. In planning any sort of an accounting system the idea should always be kept in mind to make one card or one blank serve as many purposes as possible. This is economy in the expense of printed matter, and what is of much more consequence, of time in performing the necessary clerical work. There is another advantage in passing the blank along from one office or department to another, distributing its information and acquiring new importance from the entries made upon it as it passes along. It is more valuable because it has all the force of an original entry and is subject to none of the liabilities to mistakes that frequently occur when the information is copied again and again by different persons. Whatever plans or methods are adopted for reasons of economy they should not take precedence over the necessity for accuracy. It is of the utmost importance that all entries required by whatever system or method is in operation, be made promptly and properly, for unless this is done the best system ever devised will end in a failure.

REQUISITION FOR SUPPLIES

REQ. NO._____ DATE_____

FOR THE_____ DEPT.

STORE KEEPER, PLEASE ISSUE THE FOLLOWING ARTICLES FOR USE IN THIS DEPARTMENT.

QUAN.	DIMENSIONS	DESCRIPTION	VALUE	

TO APPLY ON ORDER NO._____ _____ FOREMAN

ISSUED _____ RECEIVED THE ABOVE _____

THE IRON TRADE REVIEW

FIG. 3—REQUISITION FOR MATERIAL AND SUPPLIES. SIZE, 3 x 5 INCHES.

The Crucible Steel Co. of America is now occupying the new warehouse at Chicago, a full description of which appeared in the July 30 issue of THE IRON TRADE REVIEW. All the stock was moved from the old warehouse within the past few days.

TOOLS AND EQUIPMENT FOR THE STRUCTURAL SHOP.[1]

By Geo. P. Thomas.[2]

What enters into the make-up of a modern structural plant is largely a matter of opinion among engineers. It might not be foreign to the subject to say that no progress is possible, or no improvements are made, without touching some sort of vested interest, which will raise frequently the most strenuous objections, all from purely personal motives. This applies to the smallest detail of shop improvement. A man forms his opinion largely if not altogether by his personal experience, colored more or less by the opinion and the experience of others with whom he comes in contact.

A man who has worked for years at the same job, say punching, shearing or riveting or any other job in the shop and has become highly skilled in his particular work, will usually oppose any change in method no matter how good. Skill simply means that a man has reached the point where he can perform certain operations in a mechanical manner and where the mind guides only in a general way. To make any changes, requires new mental efforts, hence the tendency or inclination to rebel when the mind has dropped into a groove.

Three Elements in Shop.

In a structural shop as in any other manufacturing establishment there are three elements — management, workmen and equipment. Each is a part of the whole and any deficiency in one must, in a way, be made up by the others. There is a certain balance between them which must be maintained to get results and keep up with the march of progress.

Regarding what constitutes a successful shop, all plants showing a balance at the end of the year are supposed to be successful, yet this is very far from true. In the fabricating business some rather primitive shops compete all along the line, even in shop-costs, with some of the best-equipped plants. Analyzing conditions in such shops the reason can be readily discovered. The shortcomings of the equipment can be made up by the higher efficiency in management and men, a condition rather hard to obtain with present industrial conditions. There is yet another type of shop that apparently successfully competes with limited facilities. These usually are the very old established concerns with men who have been in their service for years, where any change or improvement in method is frowned upon and where likewise no new blood or very little is ever introduced. The organization is the simplest, the fixed expense low and the efficiency of the men is high. Such conditions in a shop would be ideal if it did not entail slow but sure extinction in the end.

The company constantly striving for betterment from the nature of things has higher fixed charges, the up-keep of the plant is more and the depreciation greater. If at the end of the year, even if the shop shows no greater money return to its owners than the shop cited above, its management has been a success; for instead of losing vitality it has increased it. This coupled with the better and superior class of work, made possible by the better equipment, ought to prove entirely satisfying to the owners.

The author believes in making improvements in shops, and speaking from experience, this should always be done gradually. Too much new blood and too many swift changes mean disorganization and friction and may double the cost of making improvements.

The Handling Problem.

Fabricating plants have peculiarities of their own. The problem involved here is one largely of handling. This applies not only in carrying material about for the various operations, but the actual operation as well. Positioning a piece in a shear or punch or for riveting takes greater time than actually performing the work. In machine shops, the efforts to reduce costs are largely aimed at reducing time of operation, this by improved and more powerful tools, increasing cutting speeds, the use of high speed steel, jigs, etc. In fabricating shops the aim has been almost exclusively to lessen the time to position the material for the required operation and to remove it afterward. In a modern shop this is in evidence everywhere, in the arrangement of overhead cranes, skids, punches, reaming gantries, special cranes for handling riveting work, etc.

In laying out a plant, taking into consideration all the various details, it is easy to go astray. The shop must be laid out to work almost as a unit and consequently all the various operations must be well balanced and properly located in relation to each other to work on an economical basis. The idea of building a structural plant on a scale for taking care of future growth and equipped only for present needs sounds well in theory but is not so easy to carry out in practice, if efficiency is an object. A machine shop or a foundry may be enlarged from time to time without destroying the general scheme, but this is almost impossible in a fabricating plant as to keeping it properly arranged and not disturbing the equipment already installed.

In a progressive shop the gradual changes in the management, men and methods, make altogether uncertain the laying down of any shop scheme to be carried out in the distant future. Better results are obtained to equip for the present and the future will care for itself. Providing equipment for extremes is also wrong, as for instance to provide a 10-ton crane where 95 per cent of the lifts will not exceed 2,000 pounds. Such conditions exist in the marking, shearing and punching area. Cranes of ample capacity of course should be provided, yet better results are obtained in installing cranes adapted for the lighter lifts and by dividing loads for the heavier ones. This applies also to machine capacity.

Keep Material On the Move.

The aim in a modern plant is to have the material always moving forward from one operation to the next. Return movements of course are bound to occur but this should be made the exception and not the rule. As previously mentioned, to obtain the highest efficiency the shop must work as a unit and this makes important the location of each section in relation to the other. Local conditions usually affect shop plans more

[1]From a paper presented before the Engineers' Society of Western Pennsylvania, June 16, and published in the society journal, Vol. 24, No. 6, page 303.

[2]Engineer with Standard Bridge Tool Co., Pittsburg.

or less but the best conditions are obtained when the storage yard can be located at the entering end of the shop and the loading yard at the finishing end.

Narrow gage tracks should run through the shop connecting the two. Some shops have tracks running into the shop from the storage yard on a slight down grade, permitting loaded cars to be run into the shop by gravity alone. If from the arrangement of the plant, an outlet for material must be provided through the storage yard, another parallel track may be run without the grade.

The first operation in the shop is marking and shearing, followed by punching and storing. The storage space for punched material practically makes a division. Beyond the storage space comes assembling and reaming, riveting and finishing and whatever other operations are required.

Accounting for Material.

To keep account of material as it is received, the storage yard is usually divided in numbered sections. The foreman receives material sheets of each contract with blank spaces for the date when received, number of section stored in yard and also the date when finally delivered to the shop. In this way he can look after every piece that comes into the yard up to the time it is delivered to the shop. In the best shops the marking and shearing are placed together. Material brought in on narrow gage cars from the yard is handled by overhead cranes and placed on storage skids. I believe in providing skids throughout the shop for placing the material, putting nothing on the floor except such pieces as can be handled without the crane. For storage, skids 10 to 12 inches high are used; for marking about 28 to 30 inches; for punches usually about the same height as the die and also about 28 to 30 inches. For assembling, 20 to 24 inches is about the right height. For serving shears a combination of rollers and skids are used in many shops. Skids facilitate handling of material throughout in bulk as well as in detail and keep the shop in an orderly appearance. They should be anchored down tightly since loose skids scattered around a shop floor are a nuisance; the men are shifting them around, cranes are apt to push them over in handling material, and they are never arranged properly for any purpose.

The Punch Shop.

Punching seems a simple operation at first but becomes more and more complex the deeper one goes into it. Many shops simply range their machines along the wall and provide overhead slings to feed material through. A traveling crane covers the whole floor space to bring and carry away the material. With this arrangement the most valuable part of the shop is not utilized but merely used for storage of material. In some cases, punches are located in the center of the shop, roll tables being used instead of slings, but if many machines are to be served the overhead crane cannot possibly keep them going. Another system adopted by some of the leading shops, is to run special cranes transversely in the shop to serve all tools and various operations as well as punches. This system permits a better arrangement of tools on the floor and avoids waste space. It does not, however, provide any means for transferring material forward and for doing this, narrow gage cars must be used. Carrying of material in bulk in the punch shop or providing means for carrying from one end of the shop to the other is not so much desired as the prompt serving of tools and in a properly arranged shop, such movement of materials should be the rare exception. When it does occur the cars provide a sure and safe means.

To get the best results from each punch, these should be specialized as much as possible, keeping each machine on one class of work as much as conditions will permit. The serving of the punch for feeding material is receiving more and more attention. In my mind the feeding apparatus is as important if not more so, than the punch itself. Roll tables used with a punch equipped with a gag, and controlling material with a hand lever give excellent results. It is a step in advance of the overhead sling and trolley, besides permitting a more suitable crane system to be installed and a better arrangement of machines on the floor.

Of course the ideal way of punching material is with a spacing table as a suitable machine of this kind eliminates many difficulties. The spacing table is one of the most important tools in the shop because it touches so many vital points. It reduces the template making, eliminates marking, does better punching and more of it at less cost and also effects considerable saving in the assembling and reaming through the better spacing of holes. In a way it even touches social questions and makes punching an art. It also helps to conserve our vanishing lumber supply by decreasing the consumption of template lumber.

Troubles in Punching.

Punching of material has many mysteries of its own and the behavior of the material is the source of much trouble. Curving of angles particularly, is a bugbear of the shop. Straightening is not only a slow and tedious job but stretches and strains the piece, affecting the spacing of holes, gives trouble in the assembling, necessitates reaming and affects more or less the elastic limit of material. In designing, attention is seldom paid to this treatment of the material and it is considered a sort of unavoidable evil necessary to fabricating.

Plates also stretch in punching, particularly thick and narrow cover or universal plates, and this stretching varies with every piece punched in both plates and shapes. There are several causes for this trouble aside from the mere thickness of the metal. In rolling, the heavier sections retain the heat longer and are finished at a much greater temperature than the thinner ones. The direct results of this is to lower the elastic limit in the thick sections, leaving the metal softer and with a greater tendency to stretch in punching. Pieces having the same section will show variations due also more or less to rolling at various temperatures.

The shape of the punch used also has some bearing on this and many shops use punches with slightly convex ends to strengthen the cutting edge, thereby greatly increasing the life. This shape creates a slight tendency to drift the material out, away from the cutting edge and stretches the material about the hole. Such punches are very hard to strip unless kept well greased.

Some years ago the writer made some experiments to determine how much the shape of the punches affected the stretch of the material. It was found that punches with convex ends increased the stretch very materially and this was still further increased by the shape and the size of the tip made for centering. Flat punches were much better and made a cleaner hole, while punches with a slightly concave point punched a hole almost as clean as a drill and freed themselves without a stripper. In punching thick angles with such punches the curving is not entirely eliminated, but is greatly reduced. These are not, however, practical for general use, the edges breaking off

rapidly after punching several hundred holes instead of 2,000 to 4,000 as obtained with the standard punches. On a spacing table the tendency to stretch can be reduced by using flat punches made with a slight clearance and without a tip, which produces a clean-cut hole and strips easily.

Variations in Steel.

In relation to the difference of elastic limit and the variations in hardness in ordinary open-hearth steel, every shop superintendent knows that no two pieces are ever found alike. These vary from extreme softness to glass-like hardness, in extreme cases flying to pieces in punching, or cracking about the hole. In punching thin plates or shapes which are very apt to be hard from rolling at low heat the hardness is indicated by the loud report made by the punch in penetrating.

Next to the punching in the shop comes the storage for punched material. The importance of providing ample storage space for punched stuff is not appreciated in many shops, that is, for all material except details, which should be sheared, punched and stored with the aim of avoiding unnecessary carrying. Many plants prefer to segregate this part of the work in a small building. This is not necessary, as the storing of the details should be done not far from the assemblers, at least as close as it can be done with the shear and punch properly located.

This storage space, like the storage yard, may be divided in numbered sections and material delivered there can be easily located. The foreman in charge of the punch shop can trace the material from the time he receives it from the storage yard, until it passes out of his hands in the storage space ready for the assemblers.

Low level skids about 8 to 10 inches high, should be provided for the shapes and narrow plates. For wide plates a very good plan is to store them on edge rather than flat on top of each other, as it is usually the case the plates on the bottom of the pile are wanted first and the top ones must all be moved to get them. Among other advantages it saves space, the plates are not so apt to be bent in being handled edgewise as lengthwise, and they can be picked up by the crane more easily. A good way is to provide strong posts placed three or four feet apart in the ground in rows about 18 inches wide, the height being governed by the width of the plates to be stored. In handling, yokes fitted with a pin must be kept handy, and one of these is slipped on near the center of plate in one of the edge holes. The crane can then pick up the whole mass and deposit it in a rack, the yoke being left on until the plate is delivered to the assemblers.

The Assembling Operation.

The assembling should be close to the storage space. Strong skids about 6 feet apart and 24 inches high and topped with about 70-pound rails make a very good arrangement. This provides a level space for assembling of material and avoids the danger of the use of wooden horses, which are unsatisfactory. In some shops space on the floor is provided for assembling large girders. Plates with T-slots are located 10 to 12 feet apart on concrete piers and all carefully leveled. In this way the assembling of girders is greatly simplified. The bottom chord is first placed on the plates and by blocking up on different plates any desired number can be quickly obtained without the use of strings.

Reaming and Riveting.

The arrangement for the reaming and riveting is largely affected by the system of cranes adopted. Reaming and riveting gantries will permit good use of the floor space and allow an economical arrangement and division of the tools. An overhead trolley is just as good to handle a riveter, but when located in the middle of the floors it interferes with the overhead cranes and it is impossible, unless the shop be pushed to extreme length, to get sufficient wall space to string all operations along the wall. It is not a question whether it is better to handle or serve riveters by means of gantry or overhead trolley, but simply which will work the better and use all the available floor space to the best advantage.

Riveting, like punching, has many problems. The end to attain, of course, is to drive tight rivets at as low a cost as possible. This is affected in many ways. Some shops have trouble with loose rivets, which must be cut out and replaced. I believe that a great deal of this trouble is caused by the carbonizing and scaling of the rivets in gas furnaces. In the Pittsburg district many firms make their own rivets, heating the bars in a natural gas furnace and incidentally soaking in carbon, which forms a hard steel skin all around, varying in thickness according to the time exposed. And again this process is continued when heating for driving, the rivets being allowed to soak in the furnace for hours sometime before being used. By this time the amount of carbon absorbed is so large that the rivets are practically hard steel.

This condition is a source of trouble in riveting. Carbonized rivets, even if highly heated, are very hard to drive, the metal will not flow in upsetting, the button sets are quickly worn and the wear on the riveter is greatly increased. Riveting at best is difficult. In driving rivets, the metal is upset first where the pressure is directly applied. As one head of the rivet is already formed and one of the forming dies fits this head snugly, the upsetting first begins at the extreme end, gradually forming the head as the riveter closes, the upsetting of the body to fill the hole being the last. This is the chief difficulty, as the body is the last to receive the pressure, while it is the first to begin to cool from coming in contact with the material. Combining this tendency to cool rapidly in the hole with rivets having a hard steel surface from absorbing carbon in heating, more or less trouble can scarcely be avoided.

Avoidance of Rivet Troubles.

To avoid carbonizing altogether involves problems in furnace construction and the rivets should not be allowed to come in contact with the flame. To remove scales, which is also a factor to consider, I believe it would pay to pickle the rivets, the cost thus incurred being saved in the repairs of upsetting dies.

Structural material costs about two and a half or three times as much as the fabricating. There are, I believe, possibilities here. If a modern plant does not reduce cost of fabricating, but produces a better class of work, permitting a higher factor of safety to be used as a direct result, a saving in material is made possible. This is a greater consideration than the mere reducing of fabricating cost.

The Human Element.

In the arrangement of a shop, the first cost of tools is not so much a consideration as what the cost of maintenance will be in proportion to results obtained. Into this also enters the human element that is to run the shop. The study of social questions in connection with the engineering of the plant does receive consideration usually, but it should receive far more than it does. Careless and indifferent management fosters this "don't-care-whether-school - keeps - or-not" spirit so much in evidence in some shops. The direct fruit of this is low efficiency per man, inferior

work, abuse of tools and machinery, and waste of supplies. There is no doubt that a careful and considerate management, while it will not entirely eliminate this, will greatly reduce it.

There is a disposition to treat abuse of machinery and general lack of interest in workmen as an evidence of limited intelligence. To a certain extent this may be true, but I believe also that shop conditions have considerable to do with it. In many shops, to increase the output and at the same time let the men share with the company the benefit, the premium plan is used. This plan has been found satisfactory wherever it was given a fair trial. It means a little more bookkeeping, but it is certainly worth many times the extra expense. Beside giving industrious men an incentive to work, it gives an exact record of cost. To know the cost of every operation in a plant and have means to keep close watch on it at all times is a valuable asset.

To introduce this system requires patience and time. As conditions and equipments vary in every plant, the system must be modified to suit.

Some of our philosophers have made the assertion that progress is but relative. This applies with force to the shop. A plant is never complete unless it has reached the turning point in its career. Constant efforts are required to keep it going at a given speed and the solving of one problem only brings others to solve.

A TILTING CRUCIBLE MELTING FURNACE

A new tilting crucible furnace possessing a number of novel and advantageous features, prominent among them the fact that the crucible is not removed while pouring, has been placed on the market by the Rockwell Furnace Co., 26 Cortlandt street, New York. The accompanying illustrations show the chief points of interest in this device, on which patents are now pending.

In pouring metal from this furnace, the crucible is not disturbed, but remains fixed in its regular position, the metal being transferred to the molds by means of a heated ladle or crucible, as preferred. The advantages secured by this arrangement are obvious. After the first heat, the metal is always charged in a hot pot, which greatly facilitates the melting process. In case of the crucible breaking, the metal does not run to the floor, but is retained in the furnace and the melting may be continued until the proper temperature is acquired, when the metal may be taken to the molds in the ordinary way.

Because of this arrangement and of the manner in which the heat is applied, it is stated that remarkable crucible economies are effected. The burner, which is operated with a fan blast at a pressure of 12 ounces, is practically noiseless. Either oil or gas fuel can be employed. The burner is located at the top of the heating chamber and the flame is projected downward against the bottom of the chamber and not against the crucible, which thereby is insured a maximum life. There should be no anxiety over the use of thin crucibles and no necessity of discarding them until the break actually comes, which means a net saving of several heats. The furnace is easily relined with simple and inexpensive fire tile.

As any air pressure from 12 ounces to two pounds can be used, this furnace can be operated with any available air and oil system which may be employed in supplying other furnaces, a feature which obviates the necessity of high pressure compressors or positive blowers.

The cover is manipulated by a lever conveniently located at the rear of the furnace, where a pin and ratchet arrangement holds the door rigidly in any required position. The crucible can be covered after pouring without returning the furnace to an upright position. While the blast is on, heavy pieces of metal may be fed to the crucible through the opening in the cover, as the waste heat passing through melts it down into the crucible rapidly. The furnace is tilted by means of a worm and wheel, operated by bevel gearing from the hand wheel.

Where it is essential that the heated

FIG. 1—MELTING POSITION, ROCKWELL TILTING CRUCIBLE FURNACE.

FIG. 2—REMOVING CRUCIBLE COVER WHICH PROTECTS VOLATILE MIXTURE.

gases in the furnace should not come in contact with the metal, a cover may be put on the crucible to protect it. This however, is unnecessary for ordinary work, as scrap yellow brass

FIG. 3—POURING POSITION, ROCKWELL TILTING CRUCIBLE FURNACE.

stampings from the ends of safety pins have been melted hot enough for pouring very light castings with a loss of but 3 per cent, the only precaution while melting, being to cover the metal with a few pieces of hard coal.

The number of heats per day will vary from 3 to 10, and the amount of fuel required will range from 1½ to 3 gallons of oil, 210 to 420 cubic feet of natural gas, 315 to 630 cubic feet of illuminating gas, 675 to 1,350 cubic feet of water gas of 300 B. T. U. per cubic foot. This varies according to the quantity and quality of metal melted, the heat at which the metal is required, and the attention and promptness with which it is melted and poured. The furnaces are at present made in four sizes of a capacity of 200, 375, 800 and 1,100 pounds, respectively. The floor space required by the smallest size is 41 by 64 inches; by the largest 50 by 74 inches.

Receiver Is Named.—In compliance with a bill in equity, filed by George A. Koehler, Jacob P. Koehler and the Koehler & Streng Co., old material dealers, the affairs of the Refined Iron & Steel Co., Pittsburg, have been placed in the hands of a receiver, Meyer Streng being appointed. The Refined Iron & Steel Co. has been operating a merchant iron mill near Pittsburg. The company is capitalized at $300,000, but only $237,500 of the stock has ever been issued.

GEAR DRIVE FOR ROCKFORD SHAPERS.

The Rockford Machine Tool Co., Rockford, Ill., is offering Rockford shapers with a positive speed changing device. The simplicity of the mechanism will be clearly understood by referring to Fig. 1, which shows the shaper geared to a Northern constant speed motor and provided with a friction clutch for starting and stopping the machine without disturbing the motor. It will be noted from the illustration that the gearing is all enclosed, and that the clutch lever and motor starting rheostat are conveniently located on the same side of the shaper.

The ram has eight speed changes, ranging by even progression from 12 to 90 cutting strokes per minute. The arrangement of the gearing and shifting mechanism can be readily understood by referring to Fig. 2. This drawing is a section through the driving gear box. The lower shaft carries the friction pulley and two driving gears, one of which is locked to the shaft by a spring key. The other, driven by its mate on the second shaft, runs loose at a low velocity. The driving gears both run in the same direction and the movement of the loose gear takes care of the difference in ratio of the two pairs. To the second shaft is keyed a sleeve, which carries four gears, any one of which may engage with its corresponding gear on the uppermost shaft. The bell crank arm A (Fig. 2), for moving the sleeve and gears on the shaft, rocks in a bearing at its lower end, while the upper end carries a steel pin, which operates between two flanges on the sleeve. The lower prong of the arm A is connected to the shifting lever D, by the forgings B and C. This shifting lever D is shown just to the right of the motor starting box in Fig. 1. The upper end of the lever carries a steel pin, which may be slipped into any one of the four holes on the quadrant, thus locking the shifting mechanism. The fork

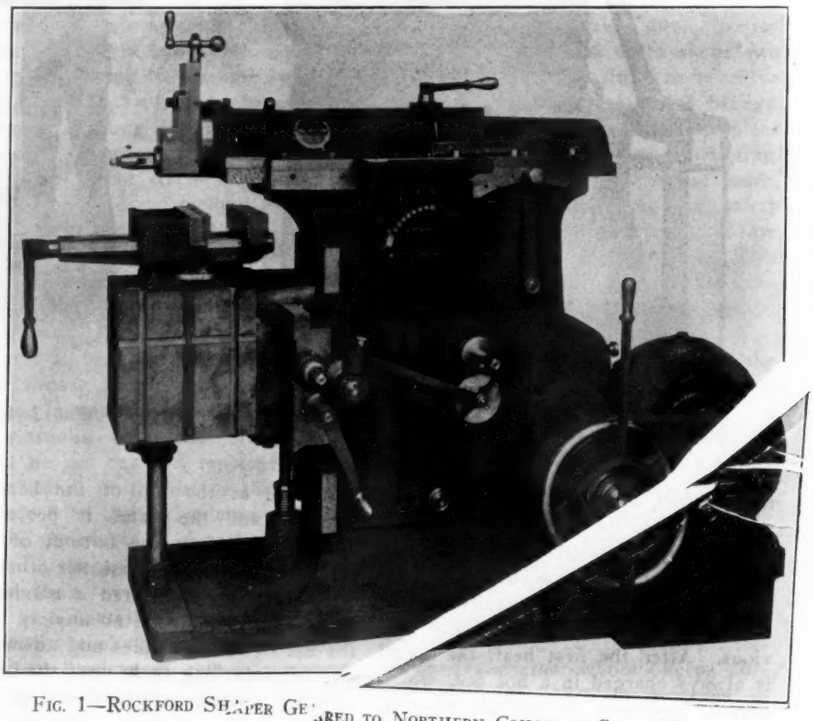


FIG. 1—ROCKFORD SHAPER GEARED TO NORTHERN CONSTANT SPEED MOTOR.

E (Fig. 2), which changes the spring key in the driving gears is operated by a similar shifting lever situated at the back of the frame. The knob of

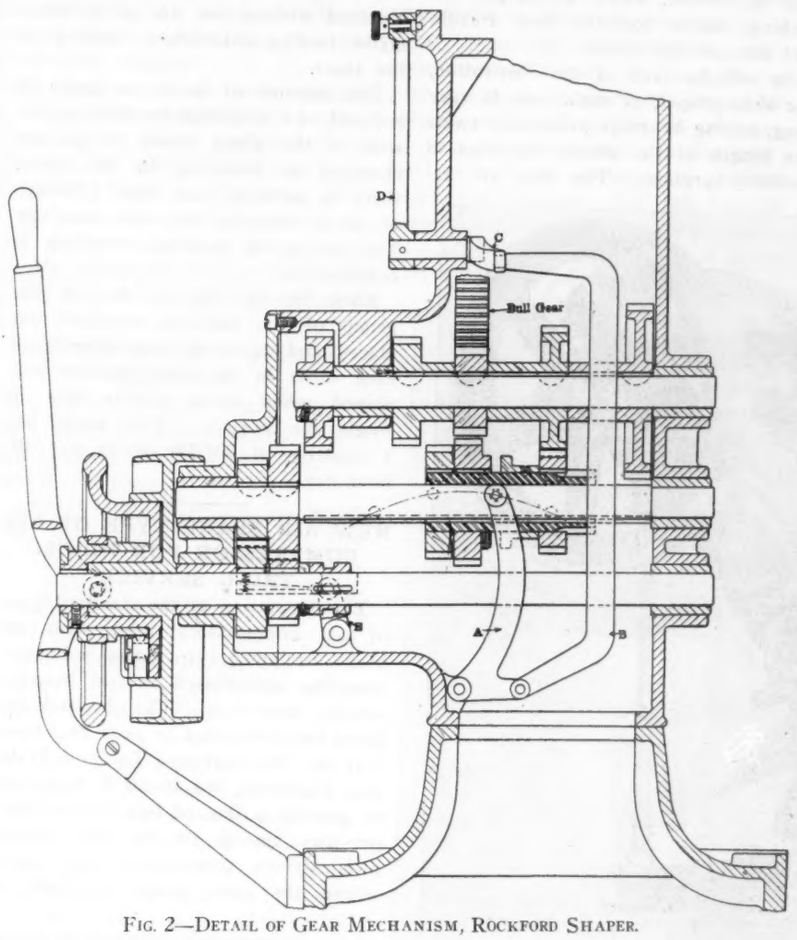


FIG. 2—DETAIL OF GEAR MECHANISM, ROCKFORD SHAPER.

this lever can be seen sticking up just behind the motor in Fig. 1. The arrangement is such that it is impossible to get any two combinations of gears in mesh at the same time.

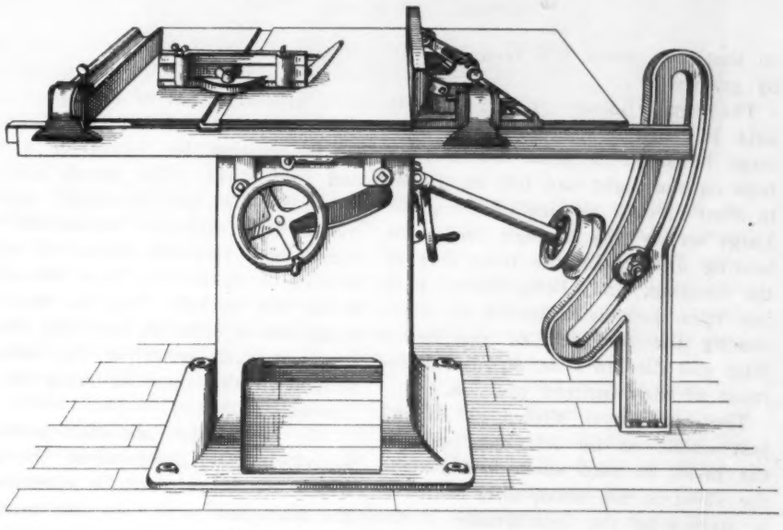
The machine is very compact and the parts are easily accessible. The floor space required is less than that necessary for a cone-driven machine. A speed plate shows the proper location of all levers for the various speeds.

Called Off Strikes.—The national executive board of the Amalgamated Association of Iron, Steel and Tin Workers has discontinued strikes at the following mills: Washington Tin Plate Co., Washington, Pa.; Standard Tin Plate Co., Canonsburg, Pa., and the Republic Iron & Steel Co.'s Birmingham plant, Birmingham, Ala. It is announced that this action does not mean that the mills have been made "open mills," but that they are now classified with the other non-union mills as when no strikes exist.

CIRCULAR SAWING MACHINE.

The accompanying illustration is a view of a recently patented circular sawing machine the object of whose design is to enable the saw to be easily adjusted to cut at any angle within a segment of 45 degrees from the vertical. The tool is so arranged as to permit of this adjustment from without the tool stand and also to provide a flexible driving connection by means of a universal joint and a radial outboard support for the driving shaft.

The saw projects up through a suitable slot in the table of the machine and is mounted on a shaft that is journaled in a bracket which is in turn carried on a frame pivoted on the machine stand. This frame carries the saw rigidly but permits of both a rotation within the arc for which it is designed and also a vertical adjustment. The adjustments of the saw are controlled by means of the hand wheels shown. The flexible driving shaft is jointed directly to the shaft which carries the saw. A pulley for driving from the line shaft is mounted on this shaft also. The table of the saw is complete with stops and guides as in the ordinary machine.



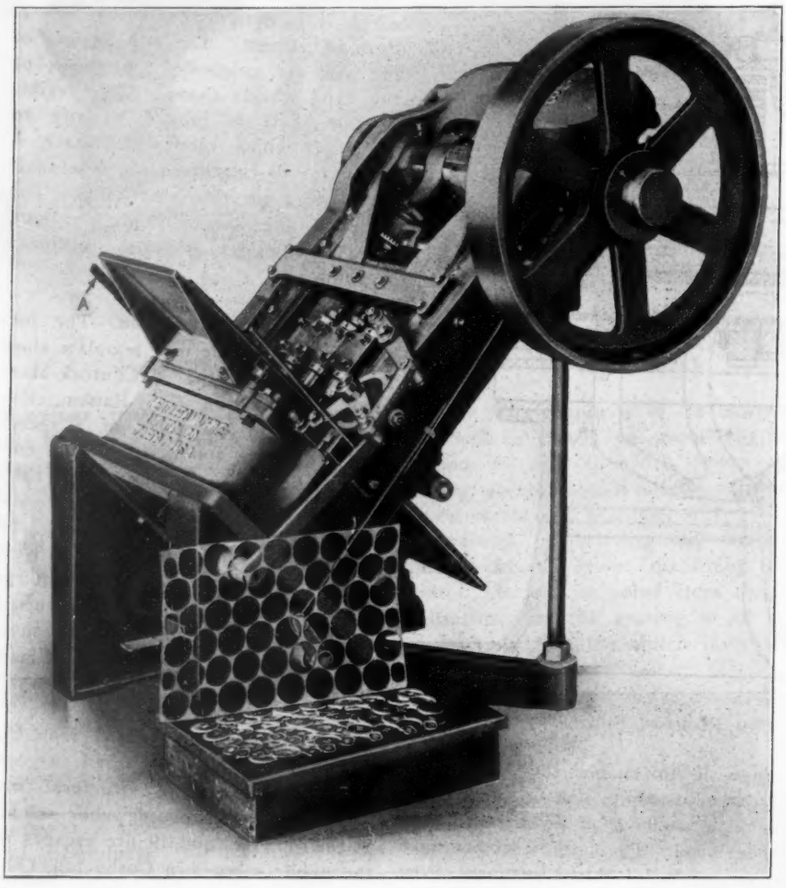
NEW CIRCULAR SAWING MACHINE.

Opened with Reception.—The formal opening of the new template shop to the plant of the McClintock-Marshall Construction Co., Rankin, Pa., was given in the form of a reception and dance conducted by the employes of the company and their friends. The guests were received by a committee of the officials and employes of the company and were shown the actual operations required in fabricating steel material. Dancing was enjoyed in the new template shop, which is 108 x 120 feet in dimensions.

The Youngstown Wire & Iron Co., Youngstown, O., has secured two contracts, including the structural iron work for two proposed public schools in Sharon, Pa., and 19 fire escapes for the public schools in Coshocton, O.

A NEW DOUBLE PITMAN GANG PRESS.

We illustrate herewith a double pitman gang press of a new pattern manufactured by the Toledo Machine & Tool Co., Toledo, O. This press is designed for operating a gang of six sets of dies for cutting out can tops or bottoms and for other classes of work of a similar nature. The machine is set in an inclined position so that the sheets will feed through by gravity.



DOUBLE PITMAN GANG PRESS.

The heavy bolster or bed plate is held in position by means of four large bolts. This plate has massive lugs on the right and left hand side in front of each housing of the press. Large screws pass through these ears, bearing directly on the front side of the housing, and, being fitted with jam nuts, provide a means of overcoming the tendency of the heavy plate and dies to slide downward because of their inclined position.

The hand lever shown at A and just visible on the left hand side of the press, is used when first placing the sheet in the press, after which it is started by the foot treadle in the regular manner, and runs continuously for the number of strokes required to finish the sheet. The press at this point is automatically stopped by a cam movement, which disengages the locking device for the foot treadle and releases the clutch.

As will be seen in the illustration, the slide proper, or main ram, is very long, having bearings practically twice the length of the similar bearings in ordinary presses. The dies are arranged in two rows of three each, one in the front and one in the rear of the slide proper. Each of the upper dies fits in a socket and is securely clamped in position by means of a cap and four studs. The punch holders, or upper dies, are provided with a quick and accurate adjustment by means of a threaded shank, on which sleeves or collars are fitted above and below the socket. The six dies are staggered in order to have the blanks intersect each other in the manner shown on the sheet of scrap in the illustration.

The lower dies are each mounted separately in independent holders, which are in turn set in recesses in the main bed plate. In this manner, a correct alignment of the upper and lower dies is maintained at all times.

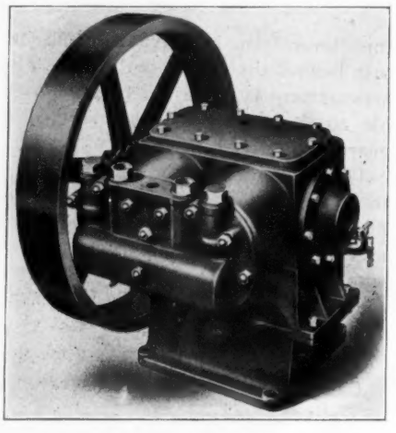
It is unnecessary to square the sheets to prepare them for this press, and the full capacity of the press is obtained without the use of an automatic feeding attachment applied to the sheet.

The amount of waste or scrap is reduced to a minimum yet keeping the web of the sheet intact to prevent clogging or buckling in the dies; there is actually less than 1/16-inch of scrap between the cut openings. The saving of material resulting is considerable.

Each die or set of dies in the group of six, may be removed, replaced and adjusted independently of each other in the same manner employed when using similar dies in single die presses. This press has a capacity of 200,000 pieces per 10-hour day.

NEW AIR BRAKE TYPE OF AIR COMPRESSOR FOR INDUSTRIAL SERVICE.

The adaptation of the standard types of air compressors used with air brake equipments to many industries requiring compressed air has been decidedly successful. The demand for them has broadened to such an extent that the Westinghouse Traction Brake Co., Pittsburg, has found it necessary to provide a line of belt driven compressors similar to its well known motor-driven compressor for cases where the only power available is from shafting or where it is not expedient to use either steam or electric motive power.



AIR COMPRESSOR.

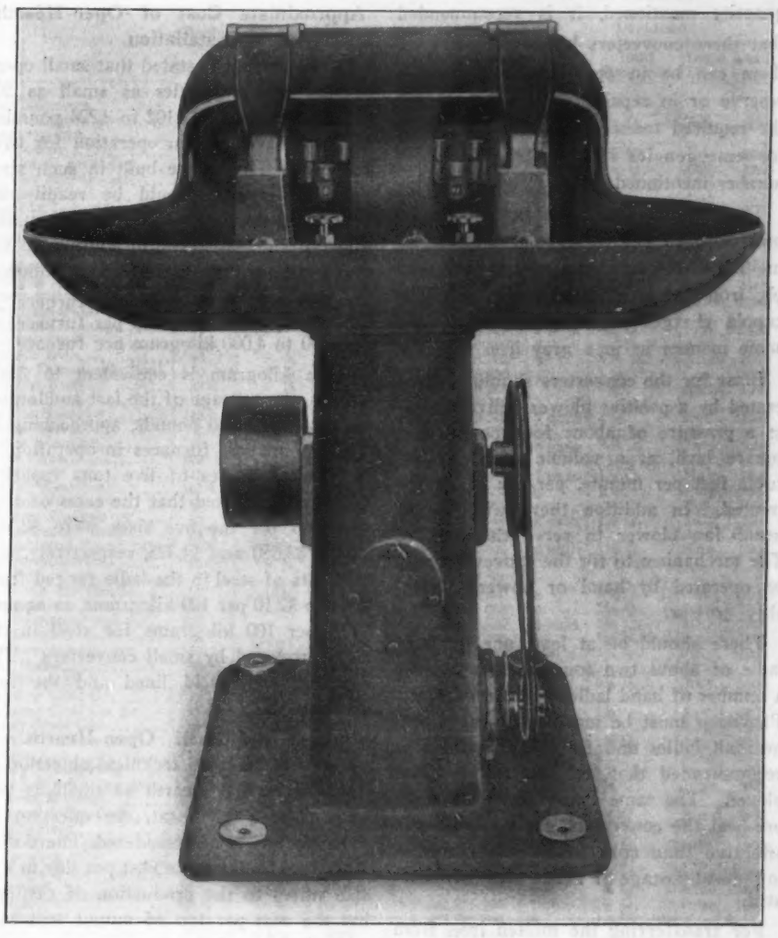
These compressors are made in four different sizes, having 15, 26, 44½ and 54½ cubic feet of free air per minute capacity, respectively, at the standard speeds. The horsepower required to operate the compressor in

the four different sizes, at 100 pounds pressure, is 3, 5, 9 and 11, respectively. They will operate successfully against pressures up to 200 pounds per square inch and may be obtained with or without water jacketed air cylinders as occasion requires.

The compressor is most compact in design, being similar in all respects to the motor driven compressor, except that the motor is replaced by a belt wheel, keyed on the crank shaft of the compressor. It is of the duplex, horizontal, single acting type, portable, applicable to any industrial service, and maintained at small cost.

GISHOLT DOUBLE EMERY GRINDER.

The Gisholt double emery grinder shown herewith represents one of the latest machines of its type. The machine is enclosed as much as possible, and is supplied with a fan water pump and a large reservoir. The water nozzle, instead of being in the usual position on the upper side of the work rest, is in the back or wheel side of the rest on this machine; thus the water, instead of coming from the nozzle directly over the wheel and rest, follows the wheel and comes around in a fine spray, meeting the work and emery wheel at the point of contact. This method of water supply does away very largely with splashing, and is of material assistance in keeping the floor dry about the machine. The machine is supplied with two emery wheels 1½ inches face by 14 inches diameter, mounted on a spindle running in adjustable self-oiling boxes. The drive is either by belt or electric motor. The spindle pulley is so protected that the belt is kept entirely shielded from water and emery, thus materially increasing its life.



GISHOLT DOUBLE EMERY GRINDER.

The Jefferson Iron & Supply Co., Birmingham, Ala., whose incorporation was recently noted, advises that its leading business will be a general iron brokerage, handling both pig, steel and scrap iron of all descriptions. It will also act as manufacturers' agent for finished products, carrying a line of steel rails, structural iron car wheels, mining cars, etc., with offices at 322-3-4 Woodward building.

According to Receiver H. H. Houston, no date has been set for a receiver's sale of the blast furnace at Chester, Pa., owned by the Tidewater Steel Co.

FREE CONSULTING SERVICE.

A contributor to the *Electrical Review* offers the following suggestions regarding the policy of doing free consulting engineering pursued by so many American manufacturers: "No manufacturer should bid on apparatus except under specifications from the prospective purchaser or his engineer. This suggestion is made in the interests of both the manufacturer and the consulting engineer, but the benefits would accrue principally to the manufacturer. The reasons which make this course advisable are: 1. The manufacturers would eliminate the cost of an enormous amount of futile engineering, done for people who have not the means to carry out their schemes nor the power to interest capital in them. 2. The sales departments would have their work, records and expenses greatly reduced because of the elimination of projects which can never be brought to fruition. 3. Business would be done between the manufacturer and an engineer, and therefore more understandingly, and on a better basis and at a lower cost. 4. The practice of having one manufacturer prepare plans and specifications at his own expense, to be hawked about to other manufacturers, would be done away with.

Machinists Locked Out.—Two hundred employes of the Driggs-Seabury Ordnance Corporation, Sharon, Pa., have been locked out because of a threatened strike. On July 9 the company announced a reduction in wages, effective July 16, the cut averaging 7½ per cent. The company claims that in the last two years the increase in wages has amounted to 20 per cent, and the reduction was necessary to compete with other concerns. A strike was ordered by the machinists' organization, but the company closed the works indefinitely before being notified.

The Missouri Pacific railroad has issued orders reopening its shops in St. Louis, Sedalia, Ft. Scott, Atchison, Osswatomie, DeSota and Baring Cross, providing employment for more than 1,000 men.

CONVERTER VERSUS THE SMALL OPEN-HEARTH.--V

By W. M. Carr.

For an average output of about 12 tons of castings daily, the following equipment will be needed to deliver steel in readiness to pour into molds. In regard to molding, core making, cleaning, etc., the equipment will be the same in both steel-making methods, differences occurring only in the style of apparatus to produce molten steel.

To keep the output steadily at the quantity mentioned, it is recommended that three converters be erected; two of them can be in operation with one in reserve or in repair. One will turn out the required tonnage, but to be prepared for emergencies it is better to have the number mentioned.

The melting equipment can consist of one or two 40-inch cupolas capable of melting about four tons of a mixture of pig iron and steel scrap per hour. The cupola charges may be handled in the same manner as in a gray iron foundry.

Blast for the converters should be generated by a positive blower delivering air at a pressure of about four pounds per square inch, at a volume of about 880 cubic feet per minute, per ton of charge treated. In addition there will be the usual fan blower to serve the cupolas. The mechanism to tilt the converters may be operated by hand or power, preferably power.

There should be at least one lip pour ladle of about two tons capacity besides a number of hand ladles of different sizes. Provision must be made to strongly preheat all ladles and for the purpose it is recommended that oil burners be employed. The same means can be used to pre-heat the converters, since oil is more effective than coke. The non-conducting disadvantage of ashes will be obviated.

For transferring the molten iron from the cupola to the converter and for pouring the steel from it into molds there should be an overhead crane of at least 10 tons capacity.

Cost of Equipment.

The cost of the equipment can be summed up as follows:

Two 40-inch cupolas, fully lined, @ $500	$1,000
Three two-ton, side-blow converters @ $1,500	4,500
One positive blower	1,000
One fan blower	150
Ladles, two-ton capacity and smaller	400
Approximate cost of steel making devices	$7,050

In addition to the foregoing there will be, of course, buildings, power, machinery, molding and core-making facilities, drying ovens, sand mills, cold saws, oil storage tank, etc., bringing the total cost to about $18,000, depending upon the character of the buildings and equipment. The writer has been informed that a single converter plant in wooden buildings cost complete only $10,000.

Approximate Cost of Open-Hearth Installation.

In Germany it is stated that small open-hearths with capacities as small as 500 to 1,000 kilograms (1,102 to 2,204 pounds) per heat have been in operation for over 30 years. They were built in such sizes that the capacity could be readily increased to double the rate of the smaller tonnage. To illustrate, in addition to the size mentioned the units ran as follows:

1,000 to 2,000 kilogram per furnace.
1,500 to 3,000 kilogram per furnace.
2,000 to 4,000 kilogram per furnace.

As a kilogram is equivalent to 2,204 pounds, the tonnage of the last and largest furnace was 8,816 pounds, approaching in size the smallest furnaces in operation in the United States of five tons capacity. It is further stated that the costs of construction for the five sizes were $2,550, $2,925, $3,650 and $4,325, respectively, and the costs of steel in the ladle ranged from $2.54 to $2.10 per 100 kilograms, as against $3.55 per 100 kilograms for steel in the ladle produced by small converters. The furnaces were acid lined and the fuel producer gas.

Cost of Small Open-Hearth.

While there is no technical objection to building an open-hearth as small as two tons capacity per heat, the question of economy has to be considered. The skilled labor will be the same cost per day in any size suited to the production of castings, but the cost per ton of output will vary with the size of the furnace. This point is self-evident and needs no elaboration. The size of the furnace desired will depend upon the demand and other conditions. Since a furnace of five tons capacity capable of yielding four heats per 24 hours is of a convenient size, the following figures will represent the approximate cost, erected within a radius of miles from the Pittsburg district:

Cost of a Five-Ton Furnace.

Prices represent furnace structure, including brick work (refractory and red) structural steel binding, iron castings, reversing valve, self-sustaining stack (steel, brick lined) and all foundations, but does not include cost of charging platform:

Brick work	$1,357
Steel stack	600
Iron castings	500
Steel binding (erected)	1,200
Bolts and washers	240
Reversing valve	400
Foundations (excavating and concrete)	690
Oil tank and pump	500
Oil burners for furnace and ladle drying	200
Two five-ton ladles	450
Total cost of furnace ready for bottom	$6,137

The foregoing cost applies to either an acid or basic structure and if basic should be the practice selected there would be an increase of about $200 for bottom making material.

Other Equipment.

In regard to other equipment needed to produce saleable castings, the items will be the same as in a converter plant of equal capacity, excepting that there is no machinery required about an open-hearth furnace and, therefore, such parts as positive blowers and fans are not required. The floor space within the buildings may be larger with an open-hearth since it will occupy an area of about 30 x 15 feet. The furnace may be elevated above the molding floor with the charging floor at a distance of 8 to 10 feet above, or the furnace may be depressed so that its charging floor will be level with the foundry floor.

The stockholders of the Fulton Machine & Vise Co., Lowville, N. Y., at the annual meeting some days ago elected the following directors: C. F. Boshart, C. D. Moore, J. E. Haberer, E. W. Fulton, A. S. Stoddard, A. E. Gebbie and M. A. Stoddard. The board then re-elected the old officers, as follows: President, A. S. Stoddard; vice president, C. F. Boshart; and secretary and treasurer, E. W. Fulton. Mr. Fulton is the active manager of the business. The treasurer's report showed that the company had had a prosperous year and with the new concrete buildings and new equipment the capacity of the old plant has been doubled.

At a meeting of the stockholders of the Lyons Iron Works, Greene, N. Y., the following officers were re-elected: President, Walter E. Lyon; secretary and treasurer, Miss Lizzie Mason.

An Excited Stock Market

Steadily advancing prices and steadily increasing volume of share transactions characterized the week in the New York stock market. The average price of stocks reached the highest level of the year, considerably above the average for the corresponding date for last year. Friday's sales reached 1,400,000 shares, the first three hours totaling 1,000,000 shares. The selling price of copper metal advanced three times during the week. Still "the coppers," aside from Amalgamated, did not rise as expected. The grain markets attracted much attention, following the government crop report showing deterioration in spring wheat and oats, but corn holding its own. Yet it is conceded that the wheat crop will exceed last year's by 20,000,000 bushels.

Monday the railroad stocks sold off, but industrials were firm. Steel and coppers lifted the general level Tuesday and they reached higher points Wednesday. The market was moderately active and another advance was marked Thursday, while on Friday the market was exciting, the sales reaching large volume. The close Saturday came with small net changes and the market active and irregular. The receivership for the large Minneapolis flour manufacturer had no effect upon either stocks or grain.

Call money loaned Monday at three-fourths of 1 per cent, the lowest rate in four years. It ruled from that figure up to 1¼ per cent for the week; time money bringing nominally 2 per cent. This follows the usual after-panic financial parallel. The statement of clearing house banks for the week shows that the banks hold $59,224,275 more than the 25 per cent reserve rule, an increase in the surplus reserve of $140,700. Loans show an increase of $2,390,700; deposits, an increase of $3,115,200; and the percentage of actual reserve of 29.35. Non-member banks and trust companies show aggregate deposits of $1,015,824,300; total cash on hand, $98,376,700; and loans, $911,307,600. Loans of New York banks today are $165,000,000 larger than the same date last year, rather surprising in view of the business contraction. Within the same period deposits have increased $292,000,000. With a total surplus reserve of $61.500,000 compared with but $8,000,000 this time last year, the bank statement has little effect upon the stock market and continues to attract little general attention.

Failures for the week were 262, compared with 275 the preceding week, and 183 the corresponding week last year. Total failures for July were 1,151, slightly larger than for June.

Shares to the number of 4,913,865 were sold, compared with 3,354,940 the preceding week and 4,402,400 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $21,691,000, compared with $14,558,000 the preceding week, and $5,375,000 the corresponding week last year.

Copper Stocks.

New York.—Amalgamated Copper closed at 82¾, a net gain of 5¾.

Boston.—Butte Coalition closed 28¼, a net gain of ¾; Calumet & Hecla closed 695, a net loss of 5; Calumet & Arizona closed 128, a net loss of 1; North Butte closed 85, no change; Quincy Mining closed 98, a net loss of 2.

Financial Notes.

The International Harvester Co. declared the regular quarterly dividend of 1¾ per cent on preferred stock, payable Sept. 1; the American Radiator Co., the regular quarterly dividend of 1¾ per cent on the preferred, payable Aug. 15, and 1 per cent on common, payable Sept. 30; the Niles-Bement-Pond Co., the regular quarterly dividend of 1¼ per cent on preferred, payable Aug. 15, and the regular quarterly dividend of 1½ per cent on the common, payable Sept. 19; the Pratt & Whitney Co., the regular quarterly dividend of 1½ per cent on preferred stock, payable Aug. 15.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. Aug. 8	Changes in Week	Date 1908 Ann. M't'g	Stock Outstanding	Dividend Basis	Dividend Last Declared	Dividend Date Last Div. Pay.
Allis-Chalmers	11⅛	+ ⅛	Sept. 3	19,820 000			
Allis-Chalmers pr	34¾	+ ¾		16.150,000	7 cum	1¾ Q.	Feb., 1904
American Can	6⅝	+ ⅛	Feb. 8	41.233.300			
Am. Can pr	61½	+ ½		41,233,300	7 cum	1¾ Q.	July, 1908
Am. Car & Foundry	41⅛	+2	June 25	30,000,000		½ Q.	July, 1908
Am. Car & Fdy. pr	103½	+1½		30.000.000	7 n. c.	1¾ Q.	July, 1908
American Loc	57	+1¼	Oct. 20	25,000.000	5	1¼ Q.	Aug., 1908
American Loc. pr	109	+2		25.000,000	7 cum	1¾ Q.	July, 1908
American Ship	42¾	+4¾	Oct. 14	7.60 .000	4	1 Q.	June, 1908
American Ship pr	100½	+ ¼		7,900,000	7 n. c.	1¾ Q.	July, 1908
Am. Steel Foundries ctfs	8	.....	Oct. 6	15.810 000			
Am. Steel Foundries(new	33¾	+ ¼		17,240.000	6 cum	2½	Aug., 1904
Barney & Smith	45	.....	June 2	2.000,000	4	1 Q.	Sept., 1907
Barney & Smith pr	102	.....		2.500 000	8 cum	2 Q.	June, 1908
Bethlehem Steel	23½	+3½	April 7	14,862,000			
Bethlehem Steel pr	54	+4		14.968 000	7 n, c.	¾ Q.	Feb., 1907
Cambria Steel	36¾	.....	March 17	45,000.000*	6	1½ S. A.	Aug., 1903
Cambria Iron	46	+ ¾		8,468.000*	4	2 S. A.	April, 1908
Chicago Pneumatic Tool	30	+5½	Feb. 17	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	33¾	+ ⅞	Oct. 19	34 235 500		3½	April, 1902
Crucible Steel	75⅞	+1⅜	Oct. 21	24,578 400			
Crucible Steel pr	49⅞	+2⅞		24,436.500	7 cum	1 Q.	Dec., 1907
Empire Steel	5	.....	Feb. 26	1,254,770			
Empire Steel pr	45	.....		2 500,000	6 cum	3 S. A.	July, 1908
Fay & Egan	100	.....	Feb. 18	1,000,000	6	1½ Q.	May, 1908
Fay & Egan pr	110	.....		1,000 000	7 cum	1¾ Q.	May, 1908
General Electric	147¼	+ ⅛	May 12	65,167,400	8	2 Q.	July, 1908
Harbison-Walker	12	.....	Jan. 20	18,000,000		½	Oct., 1907
Harbison-Walker pr	75	+4½		9.6 0,000	6 cum	1½ Q.	July, 1908
International Pump	24¾	+1¼	June 2	17.787 300		1	April, 1905
International Pump pr	79¾	+2¾		13,835,000	6 cum	1½ Q.	Aug., 1908
Lackawanna Steel	35½	— ⅛	March 11	34,971 400		.....	.....
Lake Sup. Corp	7	.....	Oct. 7	40,000,000			
New York Air Brake	79	+1¼	June 18	8.012,500	8	2 Q.	Oct., 1907
Niles-Bement-Pond	130	.....	Feb. 5	8,000 000	6	1½ Q.	June, 1908
Niles-Bement-Pond pr	100	.....		2.000.000	6 cum	1½ Q.	May, 1908
Otis Elevator Co.	35	.....	March 16	6.156,600		1½ S. A.	April, 1908
Otis Elevator Co. pr	90	.....		5.449,500	6 n. c.	1½ Q.	July, 1908
Penn. Steel	60	.....	May 11	10,750 000			
Penn. Steel pr	98	.....		16.5 0 400	7 n. c.	3½ S. A.	May, 1908
Pittsburg Coal Co.	12¾	+ ⅛	Feb. 10	28,853.400		.....	Nov., 1906
Pittsburg Coal Co. pr	47	+2¼		27,030,800	7 c.	1¾	April, 1905
Pressed Steel Car	36⅜	+2⅜	Feb. 19	12,500,000		3	Aug., 1904
Pressed Steel Car pr	93¾	—1⅛		12.500,000	7 n. c.	1¾ Q.	Aug., 1908
Pullman	166	—2½	Nov. 11	100 000,000	8	2 Q.	Aug., 1908
Railway Stl. Spring	45¾	+ ¾	March 5	13,500.000	4	2 S. A.	April, 1908
Railway Stl. Spring pr	99½	.....		13,500,000	7 cum	1¾ Q.	June, 1908
Rep. Iron & Steel	24⅝	+3⅝	Oct. 21	27,191.000			
Rep. Iron & Steel pr	82	+8¼		20,416.900	7 cum	1¾ Q.	April, 1908
Sloss-Sheffield	64	+1½	March 11	10.000,000	5	1 Q.	June, 1908
Sloss-Sheffield pr	100	+2		6,700.000	7 n. c.	1¾ Q.	July, 1908
U. S. Pipe & Fdy	27⅞	+3	June 24	12,500,000	4	1 Q.	Dec., 1907
U. S. Pipe & Fdy pr	78⅛	+5¾		12 500,000	7 n. c.	1¾ Q.	Sept., 1908
U. S. Steel	47⅜	+2⅜	April 20	505,302,500	2 n. c.	½ Q.	June, 1908
U. S. Steel pr	109¾	+ ¾		360,281,100	7 cum	1¾ Q.	June, 1908
U. S. Steel 5'	99⅞	— ⅛		463,798.000	5	5 A.	.....
Va. Iron, Coal &Coke	65½	+5½	Nov. 17	9.073 680			
Westinghouse Elec.	76	—2¾	June 24	28 933.200*	10	2½ Q.	Oct., 1907
Westinghouse Air Brake	105	.....	Oct. 6	11.000,000*		2½ Q.	July, 1908

Par value of shares, $100, except those starred (*), $50

NEWS FROM MANY INDUSTRIES

New Buyers:—

The Illinois Zinc Co., Peru, Ill., has been incorporated with a capital stock of $2,000. Calvin Wells, Thomas F. Noon and Winfield S. Clow are the incorporators.

The Modern Metal Stamping Co., Milwaukee, Wis., has been incorporated by Fred E. Sheets, H. A. Sheets and P. H. Holstein; $25,000 is the capital stock of the company.

J. Bamford, J. C. Ollard and C. Mathews are the incorporators of the Globe Iron Works, Tacoma, Wash., which has been incorporated with a capital stock of $15,000.

A charter has been granted the American Steel & Iron Co., Kennebec, Me., with a capital stock of $1,000,000. The officers are: President and treasurer, J. A. Farrer, Cambridge, Mass.; clerk, W. T. Haines, Waterville, Me.

The Dyett Machine Co., Wilmington, Del., has been incorporated by James H. Dyett, Brooklyn, N. Y.; Thomas Conington, Upper Montclair, N. J., and Philip L. Garrett, Hockessin, Del. The capital stock of the company is $100,000.

Articles of incorporation have been filed by the Rome Mfg. Co., Jersey City, N. J., to manufacture drawings, wood and metal patterns, valves, brass and iron goods, etc. The company has a capital stock of $250,000, and the incorporators are: Frank M. Orton, James M. Shay and Vincent J. Douglass, all of Jersey City.

The Georgia Pyrites Co., Jersey City, N. J., to mine and sell ore, has been incorporated with a capital stock of $25,000. B. S. Mantz, L. H. Gunther and John R. Turner, all of Jersey City, are the incorporators.

The Amesbury Metal Body Co., Amesbury, Mass., to manufacture metal carriage bodies, has been incorporated with a capital stock of $10,000. The officers are: President, John W. Foster; treasurer, James H. Walker; clerk, Fred England.

A charter has been granted the Cuyuna Iron Co., Aitkin, Minn., with a capital stock of $100,000. The incorporators are: H. S. Trayner, Cedar Rapids, Ia.; S. K. Stevenson, Iowa City, Ia., and R. W. E. Dean Jr., Aitkin.

George H. Tyrrell and Joseph Althous, 2639 Webster avenue, The Bronx, and William F. Burrough, 280 Broadway, New York, are the incorporators of the George H. Tyrrell Co., The Bronx, which has been chartered to manufacture motors, engines, deal in cars, boats, etc. The capital stock has been placed at $50,000.

J. G. Barr Electric & Heating Co., 120 Randolph street, Chicago, has been granted a charter to manufacture electric motors and equipment. The incorporators are: Jesse G. Barr, A. B. Irwin, Frederick Merrill, and the capital stock is placed at $10,000.

A charter has been granted the Chicago Combination Cupola & Machine Co., 1410 Marquette building, Chicago, foundry and machine shop. The capital stock of the company is $5,000, and the incorporators include Charles S. Burton, Edward T. Wray and Walter Eyers.

A charter has been granted the Federal Drop Forge Co., Queens, N. Y., to manufacture tools, machinery, etc. The company has a capital stock of $50,000, and the incorporators are: Thomas J. Mulvaney, 211 Percy street, Queens; Charles Horgan and Allen S. Green, Troy.

The European Churchward Steel Co., Jersey City, N. J., to manufacture steel, iron and kindred products, with $200,000 capital stock, has been incorporated by Charles M. Dally, 29 Broadway; Charles A. Burr, 104 West Ninety-fourth street, both of New York, and Frank H. Waggoner, Upper Montclair.

Articles of incorporation have been filed by the General Waves Power Co., Camden, N. J., machinists and electrical engineers, etc. Edgar E. McWhiney, George E. Holmes and Frank A. Kuntz, all of Camden, are the incorporators of the company, which has a capital stock of $200,000.

Articles of incorporation have been filed by W. Ames & Co., Jersey City, N. J., with a capital stock of $300,000. The incorporators are: James W. Ames and Frederick S. Ames, 290 Valley Road, Montclair; Charles M. Vreeland, 53 Summit avenue, Jersey City. The company will manufacture and deal in iron, steel and copper.

Carl H. Page, 1627 Broadway; Robert R. Montgomery, 165 Broadway; Henry B. Leary, 55 Broadway, all of New York, are the incorporators of the Carl H. Page Co., New York, which was recently granted a charter to manufacture spark plugs, motors, engines, etc. The company has a capital stock of $50,000.

A charter has been granted the Kertie Insulated Wire & Cable Co., New York, to manufacture insulated wires, cables, etc. The company has a capital stock of $500,000, and the incorporators are: Richard D. Brixey, Seymour, Conn.; Reginald W. Brixey, 2 Rector street, New York; Abel Crook, 113 St. James Place, Brooklyn.

The Ward Nail Co., Youngstown, O., has been incorporated for $10,000 by David R. Ward, David Tod, Louis S. Baldwin, A. B. Calvin and A. B. Stough. The company will develop a new process for the manufacture of wire nails, which has been invented by Mr. Ward.

New Construction:—

The Smith & Watson Iron Works, Portland, Ore., has taken out a permit for the erection of a two-story brick building to cost $25,000.

The old buildings of the J. F. Byers Machinery Co., Ravenna, O., have been remodeled and a new foundry and new assembling shop have been constructed preparatory to the expected rush of new business.

The Turner-Forman Concrete Steel Co. has a contract for reinforced concrete columns and floors in the warehouse being built for the Pennsylvania Warehousing Co., Philadelphia; contract price, $31,000.

The Atlas Motor Car Co., Springfield, Mass., is to erect a three-story brick and wood addition to its present factory, so it can about double its output of cars. The new building will be 50 x 150 feet. Considerable new machinery will be required.

The plant of the Canonsburg Steel & Iron Co., Canonsburg, Pa., has just undergone some extensive repairs. Two sections of the mill, one 60 x 100 feet and the other 20 x 100 feet, have been raised, new boilers have been put in, and the water tanks have been torn out and rebuilt.

The Osterman Mfg. Co., operating a car repairing plant at West Pullman, near Chicago, has purchased 30 acres adjoining the plant to add to the facilities of its plant. Tracks will be laid on the newly acquired land and open air repairing will be provided for.

Watson & Huckel, architects, Philadelphia, have prepared plans for a

warehouse for storing iron and steel for the C. C. Knight Co., Philadelphia. The structure will be 100 x 180 feet, six stories high, reinforced concrete construction, and will cost about $150,000.

Andrew Gram has purchased the factory building of the Triumph Food Co., Menominee, Mich., and will convert it into a machine shop.

General Industrial:—

The Fox Lead & Zinc Co., Platteville, Wis., is negotiating with the Helena Iron Works for a new roasting plant.

The Waterman Car Wheel & Foundry Co., Houston, Tex., has amended its charter, changing its name to the Houston Car Wheel & Machine Co.

The Ohio Steel Foundry Co., Lima, O., recently received orders from various car building interests for cast steel center plates to equip 1,200 freight cars.

The Bass Foundry & Machine Co., Ft. Wayne, Ind., advises that the damage sustained by its plant by fire was only nominal and repairs have already been made.

The Vincennes Pipe & Castings Co., Vincennes, Ind., which went into the hands of a receiver a short time ago, resumed work Aug. 2, and the local superintendent announces that it will continue to operate, having stocked up on raw material.

Aaron A. Ferris, receiver of the Field-Evans Co., has filed in court a report of receipts and disbursements covering a period from the date of his appointment, Nov. 6, 1905, to July 23. The receipts aggregate $2,827.28 and the disbursements $2,206.45.

The annual stockholders' meeting of the Youngstown Foundry & Machine Co., Youngstown, O., resulted in the election of the following board of directors: W. J. Wallis, A. E. Adams, F. A. Williams, S. K. Hine, B. G. Parker, Harry Parrock and T. B. Van Alstine.

At a meeting of the directors of the Aluminum Co. of Pennsylvania, Connellsville, Pa., the following officers were elected: President, J. A. DeWitt; vice president, J. D. Madigan; secretary and treasurer, W. C. Armstrong.

The Tennessee Blow Pipe Co., Chattanooga, Tenn., manufacturer of galvanized iron blow piping, advises respecting its recent incorporation that it is completing the organization of the company, and will be in shape within a few days to handle inquiries for anything in sheet metal work. It will pay especial attention to heavy galvanized iron work, particularly blow pipe equipment for factories and wood-working plants. In addition it will make a general line of cornice, gutterings, etc., also ventilating and air heating equipment. Its shop is fully equipped for this work so that the company will not be in the market for tools and machinery.

The Clarage Foundry & Mfg. Co., Kalamazoo, Mich., received a few days ago from the Underfeed Stoker Co. of America, an order for castings that will keep the plant on Church street, as well as the North Side foundry, also owned by Mr. Clarage, busy for several weeks.

The O'Keefe-Orbison Engineering & Construction Co. is making plans for a hydro-electric development near Iron Mountain on the Menominee river, for the Oliver Mining Co. The project includes a dam that will develop power under a 61-foot head of water and produce about 12,000 electrical horsepower.

The Greenpoint Metallic Bed Co., Brooklyn, N. Y., manufacturer of metal bedsteads and furniture, advises respecting its recent fire, that it will probably replace part of its damaged plant, which consisted of a one-story building 60 x 200 feet. There will be no new equipment required other than that which the company now has.

The Linton Rolling Mill Co., Linton, Ind., advises that it has not been quoting the low prices on rails recently named by some companies. The Linton company has advanced its prices recently an additional $1 per ton, and expects to hold firmly to that figure. The company manufactures rails from 12 to 40 pounds, and also splices and spikes.

The Lima Locomotive & Machine Co., Lima, O., has received orders for extensive repairs on a number of Wheeling & Lake Erie locomotives, several of which are now being shipped to Lima. The total number of engines to be repaired will depend on conditions at the railroad shops, and the Lima plant, and may be as high as 40.

The Co-operative Foundry Co., Rochester, N. Y., writes respecting its Illinois incorporation, that it has established a western branch and distributing agency in Chicago at 264 South Clinton street, from which the western trade will be supplied with its goods, including the "Red Cross" line of stoves, ranges and heaters, also the Adjax and Bermuda furnaces made by the Co-operative company and its repairs. It has a large six-story warehouse in which the office is located and in which it will carry a full line of goods, and from which the western shipments will be made. There will be no new building done and no new equipment installed.

The Leader Fence Machine Mfg. Co., St. Charles, Ill., has raised its capital stock from $15,000 to $60,000, and has so amended its corporation papers. J. H. Keist, an officer of the company, has been inspecting sites in Elgin and Aurora, with the view to moving the factory to either of these sites, as there is said to be no available building in St. Charles for the enlarged plant.

The Huckle Gas Engine Co., Lexington, Ky., which was recently organized, has leased the two-story building at Spring and Vine streets, and will begin the manufacture of the Huckle gas engine shortly. The company has purchased planers, lathes, boring mills, drills, etc. The cylinder castings will be made in Ashland, Ky., and will be finished in the Lexington plant.

The Baird Railway Steel Tie Co., Topeka, Kans., has purchased of E. J. Grubel a foundry building and tract of land at Topeka, Kans., for $12,500 and will begin the manufacture of steel railway ties. The officers of the company are: President, Archibald M. Baird, of Topeka; vice president, J. W. Butterfield; secretary, J. L. Atwood, and treasurer, E. D. Coon.

The Independent Pneumatic Tool Co., Chicago, has increased its force of workmen at the Aurora, Ill., plant, following the receipt of a large number of orders from railroads, foundries, boiler shops and bridge works. The company announces that during the first two weeks of July it received more orders for its Thor pneumatic tools and appliances than during any similar period since last October.

The Shelton Machinery Co., Seattle, Wash., recently incorporated, advises that the firm has been in business for some time previous to its incorporation. It carries full stocks of gasoline engines, vise making machinery, boilers, engines, pumping plants, and farm machinery of all kinds, shipping from factories in car lots and distributing to the agricultural and manufacturing trade. It is not a manufacturer.

The Forsythe Foundry & Machine Works, Winston-Salem, N. C., has been sold to the Cook-Lewis Co. of Greensboro. The owners propose to improve the plant and have announced these officers: Manager, W.

D. Cook; manager of machine department, L. E. Fishel; in charge of the office at Winston-Salem, J. F. Learner. The Greensboro office will be in charge of A. B. Lambert and H. C. Snyder.

The Perfection Oil Tank Co., Syracuse, N. Y., advises respecting its recent incorporation that it has taken over the business of the Perfection Oil Tank Co., which has been established since 1872. Since it took over the old plant and all its tools, it will not do any building and will need no equipment for some time. The business will include the manufacture of all kinds of oil and gasoline tanks, as well as wooden cased cabinets.

At the recent annual meeting of the White Iron Lake Iron Co., held in Duluth, the following directors were elected: J. B. Labrec, Joseph Lafortune, Thomas W. Forest, Joseph Trudel, F. T. Teporten and Reimer Hoch. The directors chose Mr. Laorec president, Mr. Lafortune vice president, Mr. Forest secretary, and Mr. Trudel treasurer. The company has been developing an iron mine on the Vermillion range for a number of years.

The Newman-Andrew Co., New York City, whose incorporation was noted recently, advises that it is the incorporation of the business of the United States branch of the John H. Andrew & Co., Ltd., Sheffield, Eng., manufacturer of the "Toledo" brand of crucible steel; that the incorporation followed naturally upon the business assuming a larger growth; and that the affairs of the branch will be conducted without change along the same lines followed for a number of years previous.

The Modern Machinery Co. has formally taken possession of the Central City Iron Works, Stevens Point, Wis., under a lease with the privilege of purchasing at the expiration of three years. The principals in the company are Allen J. Patch, of Stevens Point, and Francis C. Cary, of St. Paul. The partnership will soon be resolved into a corporation. The company will make a line of gasoline, power and traction engines, pumping machines, and a general line of ornamental and structural iron.

A strike involving the buffing and polishing departments at the Badger Brass Works, Kenosha, Wis., resulted from the company ordering a reduction in prices for piece work of about 12½ per cent. Twenty-five men are out. To get a ruling from the supreme court, on the question of injunctions in labor troubles, organized men of Kenosha will appeal the case of the Badger Brass Mfg. Co. against John Daly, et al., members of the buffers' and polishers' organization. The original order enjoined the men from interfering with men employed at the plant and prevented picketing.

Four hundred striking employes of the Newport, Ky., rolling mills returned to work Aug. 1. They walked out because the company announced its intention to hold back two weeks pay, but admitted the strike was not justified.

Work on five bridges will be carried on by the Milwaukee Bridge Co. during the present month, the largest of which will be the First avenue bascule bridge in Milwaukee. Operations will also be started on the erection of an electric railway viaduct at Topeka, Kans., and on a double track elevation of the Pennsylvania road.

Trade Notes:—

Carse Bros. Co., machinery dealers, and David B. Carse & Co., engineers, formerly located at 12 Broadway, New York City, are now established in the City Investment building, 165 Broadway.

Leiman Bros., New York City, builders of sand blasts, air compressors and other apparatus in this line, have moved their offices to 62 John street. Their factory is located in Newark, N. J.

Gas & Gasoline Engines. Olney & Warren, 66-68 Centre street, New York, are issuing a small catalog describing gas and gasoline engines ranging in capacity from 3 to 50 horsepower. These engines are suitable for pumping stations, small shops, printers and contractors. They can be used either with gas or gasoline.

The Barco Brass & Joint Co., 56 North Jefferson street, Chicago, which was incorporated early in May, announces that it has become exclusive owner of Martin's patents for making flexible joints, and intends to continue the business with increased facilities. The joint was known for a time as the Holland flexible joint, but in the future the company will call it by its own name—the Barco.

Fires:—

The San Jose Foundry, San Jose, Cal., was slightly damaged by fire July 25.

The plant of the Albany Iron Works, Albany, Ore., the largest foundry in the state outside of Portland, was damaged by fire July 31, the loss being placed at about $10,000. The molding room was severely damaged as well as the machine shop, but the machinery suffered little injury.

The plant of the Michigan Pipe Co., Bay City, Mich., had its fourth fire July 29, the loss being placed at about $20,000.

The Columbia Wire & Iron Works, Portland, Ore., was damaged, July 25, to the extent of about $300 to the building and some damage to tools and equipment.

Lightning set fire to two 250-barrel tanks of oil in the property in the Follansbee field owned by the LaBelle Steel Co. This is the third fire the LaBelle company has had in this field in the last few weeks.

The plant of the Holbrook-Armstrong Iron Co., Racine, Wis., was damaged $5,000 by fire on July 29. The fire originated in the pattern vaults and many valuable patterns were destroyed. The loss is covered by insurance. December last the plant was badly damaged by fire.

Trade Publications:—

GAGES.—The American Steam Gage & Valve Co., Boston, 1908 catalog, 6 x 9 inches, 127 pages. A complete line of standard steam, air, water, ammonia and vacuum gages, together with gage fittings, revolution counters, gage testers, throttling calorimeters, draft gages, thermometers, pyrometers and whistles are illustrated and described in this book. Prices are given on all articles. The catalog also contains convenient reference tables for ordering spare parts and closes with an exhaustive index and telegraph code.

BENDING TOOLS.—Estep and Dolan, Sandwich, Ill., 1908 catalog. Eye, angle and hinge bending machines of a unique type operated by hand are fully described and illustrated in this catalog. Prices are given, together with many useful hints on bending.

BLOWERS.—P. H. & F. M. Roots Co., Connersville, Ind., catalog of smelting and high pressure blowers, 8 x 10 inches, 41 pages. This book contains not only complete descriptions and illustrations of the Roots high pressure blower, but presents also a large amount of original matter relating to its proper installation and care. A number of valuable charts and tables, by means of which the capacity, power required and efficiency of blowers operating under various conditions can be determined, concludes the catalog.

FACTORY ARC LAMPS.—The General Electric Co., Schenectady, N. Y., describes in bulletin No. 4603 an arc lamp specially suited to the illumination of mills and factories, where the vibration caused by machinery and the variation in line voltage resulting from the use of motors for machine drive render the ordinary arc lamp unsatisfactory. The lamp described is of the multiple type and is for use on 220-volt direct-current circuit. In the design of this lamp special attention has been paid to the insulation of the binding posts and the hanger, in order to render practically impossible the grounding of the lamp as a result of the accumulation of dust on the top.